2013 ABAER 011
CEAA Reference No. 59540

Report of the Joint Review Panel

Shell Canada Energy Jackpine Mine Expansion Project

Application to Amend Approval 9756
Fort McMurray Area

July 9, 2013

Joint Review Panel Established by the Federal Minister of the Environment and the Energy Resources Conservation Board

REPORT OF THE JOINT REVIEW PANEL ESTABLISHED BY THE FEDERAL MINISTER OF THE ENVIRONMENT AND THE ENERGY RESOURCES CONSERVATION BOARD
Decision 2013 ABAER 011: Shell Canada Energy, Jackpine Mine Expansion Project, Application to Amend Approval 9756, Fort McMurray Area

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JACKPINE MINE EXPANSION PROJECT JOINT REVIEW PANEL
Calgary, Alberta

SHELL CANADA ENERGY
APPLICATION TO AMEND APPROVAL 9756
JACKPINE MINE EXPANSION PROJECT
FORT MCMURRAY AREA

2013 ABAER 011
AER Application No. 1554388
CEAA Reference No. 59540

SUMMARY AND DECISION

[1] Shell Canada Energy (Shell) applied to the Energy Resources Conservation Board (ERCB) for an amendment to the Jackpine Mine—Phase 1 (Phase 1) Approval 9756 to increase bitumen production. The Jackpine Mine Expansion Project (the Project), located about 70 kilometres north of Fort McMurray, would include additional mining areas and associated processing facilities, utilities, and infrastructure and would increase bitumen production by 15 900 cubic metres per day. Shell submitted an environmental impact assessment (EIA) report to Alberta Environment and Sustainable Resource Development[1], the Canadian Environmental Assessment Agency (CEAA), and the ERCB. The EIA forms part of the application to the ERCB.

[2] The *Oil Sands Conservation Act* (*OSCA*), the *Environmental Protection and Enhancement Act*, and the *Water Act* require provincial approvals for the Project. The *Public Lands Act,* the *Municipal Government Act,* and the *Historical Resources Act* require ancillary approvals. The *Fisheries Act* and the *Navigable Waters Protection Act* require federal approvals.

[3] The federal Minister of the Environment and the Chairman of the ERCB entered into the *Agreement to Establish a Joint Review Panel for the Jackpine Mine Expansion Project* (the Agreement) on September 20, 2011. They established the Joint Review Panel (the Panel) under it and appointed Mr. J. D. Dilay, P. Eng. as the Panel chair, and Mr. A. Bolton and Mr. L. Cooke as Panel members. Under the Agreement, the Panel must conduct its review in a manner that discharges the responsibilities of the ERCB under the *Energy Resources Conservation Act* (*ERCA*) and the *OSCA* and discharges the requirements of the *Canadian Environmental Assessment Act, 2012* (*CEAA, 2012*) and the terms of reference attached as an appendix to the Agreement.

[4] In July 2012, *CEAA, 2012* came into force and repealed the *Canadian Environmental Assessment Act*. The Panel's assessment continued under the process established in section 126 of the *CEAA, 2012* as if it had been referred to a review panel under section 38 of the *CEAA, 2012*. The Minister and Chairman signed an amendment to the Agreement on August 3, 2012, to account for the *CEAA, 2012* changes. The amended Agreement states that the Panel's report shall set out the rationale, conclusions, and recommendations of the Panel, relating to the environmental assessment of the Project, including any mitigation measures and follow-up program, and a summary of comments received from the public, including Aboriginal persons and groups. The report must also identify those conclusions and mitigation measures that relate to the environmental effects to be taken into account under section 5 of the *CEAA, 2012*.

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[1] Alberta Environment and Alberta Sustainable Resource Development were combined in 2012 to form Alberta Environment and Sustainable Resource Development

[5] The Panel conducted a hearing that began in Fort McMurray, Alberta on October 23, 2012, and concluded in Edmonton, Alberta on November 21, 2012.

[6] On June 17, 2013, the *Responsible Energy Development Act* (*REDA*) came into force in Alberta. The *REDA* repealed the *ERCA* (which established the ERCB) and created the Alberta Energy Regulator (AER). In accordance with the terms of the *REDA*, the AER assumed all of the ERCB's powers, duties, and functions under Alberta's energy resource enactments, which include the *OSCA*. Under the terms of the *REDA* and its *Transition Regulation*, the AER assumed the position of the ERCB under the Agreement, and it completed the ERCB's responsibilities under the Agreement. Throughout this transition from the ERCB to the AER, the authority of the Panel members continued without interruption in accordance with the *Transition Regulation*.

[7] Section 3 of the *ERCA* required the Panel to consider whether the Project was in the public interest when the Panel conducted the hearing. The Panel has therefore included findings about the public interest in this report to indicate how it considered the public interest when it conducted the hearing. The Panel is also aware of its responsibilities under section 15 of the *REDA* and section 3 of the *REDA General Regulation* and is satisfied that throughout this proceeding and in this decision report it has considered the factors that are identified in those provisions. This includes a consideration of the social and economic effects of the Project and of the effects of the Project on the environment.

Decision

[8] Having regard for its responsibilities under the *REDA*, *ERCA*, *OSCA*, and *CEAA, 2012*, the Panel has carefully considered all of the evidence pertaining to Shell's application. The Panel notes that the Project is in an area that is nearly surrounded by other oil sands mines and in which the government of Alberta has identified bitumen extraction as a priority use. The Panel further notes that Shell's application is for an expansion of an existing oil sands mine project. The Project would provide significant economic benefits for the region, Alberta, and Canada. Although the Panel finds that there would be significant adverse project effects on certain wildlife and vegetation, under its authority as the AER, the Panel considers these effects to be justified and that the Project is in the public interest. The Panel has decided to approve AER Application No. 1554388 and to amend AER Approval 9756, subject to the conditions in appendix 5. The Panel expects Shell to adhere to all of the commitments it made to the extent that those commitments do not conflict with the terms of its AER approval, any other approval or licence affecting the Project, or any law, regulation, or similar requirement that Shell is bound to observe.

[9] The Panel finds that the Project would likely have significant adverse environmental effects on wetlands, traditional plant potential areas, wetland-reliant species at risk, migratory birds that are wetland-reliant or species at risk, and biodiversity. There is also a lack of proposed mitigation measures that have been proven to be effective. The Panel also concludes that the Project, in combination with other existing, approved, and planned projects, would likely have significant adverse cumulative environmental effects on wetlands; traditional plant potential areas; old-growth forests; wetland-reliant species at risk and migratory birds; old-growth forest-reliant species at risk and migratory birds; caribou; biodiversity; and Aboriginal traditional land use (TLU), rights, and culture. Further, there is a lack of proposed mitigation measures that have

proven to be effective with respect to identified significant adverse cumulative environmental effects.

[10] The Panel understands that the provincial and federal governments will need to make separate decisions about the Project, taking into account the Panel's report. The Panel acknowledges that Shell is planning to reclaim the Project footprint to equivalent land capability. The Panel believes that reclamation is useful but that it will not mitigate all of the significant effects because some habitat types cannot be reclaimed (e.g., peatlands), and reclamation will not occur or be complete for many years.

[11] Minimizing adverse effects may be difficult or impractical in a large mine because it generally requires sterilizing bitumen resources, or it may impose constraints that affect the ability to operate the mine in a safe, efficient, and economical manner. However, the Panel is concerned about the lack of mitigation that has proven to be effective for the loss of these habitats and believes that without additional mitigation, significant adverse effects will occur.

[12] The Panel believes that conservation offsets are one of the few available mitigation measures that could be used to mitigate these effects. The Panel is also of the view that offsets used to help mitigate project effects would also help mitigate cumulative effects. However, Shell did not propose or support the use of conservation offsets, and none of the other participants in the hearing provided any evidence on the possible location of such offsets that would allow the Panel to assess the potential for the offsets to further mitigate the effects of the Project. The Panel therefore recommends that before other provincial and federal approvals are issued, the governments of Canada and Alberta cooperatively consider the need for conservation offsets to address some of the likely significant adverse effects of the Project. The Panel also recommends that if the governments of Canada and Alberta identify offsets as necessary, the selection and implementation of conservation offsets should consider the effects of the offsets on existing Aboriginal TLU and consider the need to maintain areas for traditional use by Aboriginal peoples, including areas containing traditional plants and other culturally important resources.

[13] With regard to the prediction of significant cumulative effects for several key indicator resources and species at risk, the Panel has determined that the Project itself only contributes incrementally to some of these effects and that most of these effects result from projects and disturbances that either currently exist or have already been approved. The Panel took a conservative and precautionary approach when making these determinations and recognizes that any determination of significant adverse cumulative effects includes some degree of uncertainty.

[14] The Panel also believes that the *Lower Athabasca Regional Plan* (*LARP*), although still a work in progress, is an appropriate mechanism for identifying and managing regional cumulative effects, including the proposed biodiversity management framework and new Alberta wetlands policy (both in development). The *LARP* is an excellent and important framework for beginning to introduce a more integrated regional approach, and the Panel strongly encourages Alberta to continue to implement this regional plan. It is critical that the frameworks, plans, and thresholds identified in the *LARP* be put in place as quickly as possible. Future project reviews will benefit greatly from the completion of this regional approach.

[15] The Panel also notes that the governments of Canada and Alberta have established the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* in order to ensure

environmentally responsible development of the oil sands resource, and this initiative will help promote a better understanding of cumulative effects in the Lower Athabasca region.

[16] The Panel has made 88 recommendations to the federal and provincial governments (appendix 6). The Panel believes that these recommendations are important for the successful implementation of the Project and for the future development of the oil sands area. The Panel also sets out 22 conditions for Shell (appendix 5).

Summary of Key Findings

[17] While some uncertainties continue at the project level, particularly with groundwater modelling, bitumen recovery, tailings management, and reclamation, Shell stated that it will continue to use an adaptive management strategy and will work with regulators to address the uncertainties and site-specific issues associated with the mining and processing of oil sands in its lease areas.

[18] The Panel has concluded that the Project would provide significant economic benefits for the region, the province, and Canada. The Project is an expansion of an existing project and is in an area where the government of Alberta has identified bitumen extraction as a priority use. Shell stated that the Project will result in the recovery of about 325 million cubic metres of dry bitumen over its approximately 40-year life. The municipal, provincial, and federal governments will all receive significant financial benefits as a result of the Project. The Project will provide major and long-term economic opportunities to individuals in Alberta and throughout Canada, and will generate a large number of construction and operational jobs.

[19] The Panel finds that diversion of the Muskeg River is in the public interest, considering that approximately 23 to 65 million cubic metres of resource would be sterilized if the river is not diverted, and considering the low level of predicted environmental effects on water quality and quantity in the lower reaches of the river. The upper reaches of the Muskeg River to be diverted have low fisheries habitat value, and the evidence indicated only limited Aboriginal use of the area. The Panel recognizes that the relevant provincial agencies were not at the hearing to address questions about why the Project is not included in the *Muskeg River Interim Management Framework for Water Quantity and Quality*. The Panel believes that there will be significant and unacceptable sterilization of bitumen if the diversion does not occur.

[20] The Panel recognizes that Shell's proposal to eliminate mature fine tailings (MFT) from the Project's end pit lakes (EPLs) will improve current tailings management practices and could reduce potential toxicity in receiving water bodies and potential fish tainting risks. The Panel agrees with the adaptive management concept and concludes that with the implementation of Shell's proposed mitigation measures and commitments and with the Panel's conditions, expectations, and recommendations, significant adverse environmental effects are unlikely to result from the use of MFT-free EPLs. However, the Panel requires that Shell report on alternatives to treating EPLs passively and provide a comprehensive economic and technical assessment of feasible active water treatment options to ensure that EPLs will meet water quality release criteria at closure.

[21] Although the Panel has concluded that the Project is in the public interest, project and cumulative effects for key environmental parameters and socioeconomic impacts in the region have weighed heavily in the Panel's assessment. In approving this Project, the Panel has set new

approval conditions for mining operations, resource conservation, tailings management, groundwater, EPLs, and reclamation. For a summary of the new conditions, refer to appendix 5. The Panel has also made recommendations, summarized in appendix 6, to the federal and provincial governments.

Environmental Effects

[22] The Panel has concerns with some of the methods used by Shell to assess effects on terrestrial resources and Aboriginal TLU, rights, and culture. These concerns are that the local study area (LSA) consists of only the Project and existing Phase 1 footprints, that there is a lack of ecological context, and that the large size of the regional study area (RSA) adopted by Shell causes a "dilution effect." The Panel also found it difficult to assess the significance of effects because of the coarse-scale Landsat imagery Shell used to estimate land cover type, because of the lack of use of thresholds to determine significance, and because of Shell's consequent reliance on professional judgement.

[23] The Panel concludes that it could not rely on Shell's assessment of the significance of project and cumulative effects on terrestrial resources. The Panel reviewed the evidence using a 20 per cent loss threshold and considered other factors relating to the reliability of Shell's determination of the significance of effects.

[24] The Panel concludes that the Project would have significant adverse environmental project effects on wetlands, traditional plant potential areas, wetland-reliant species at risk, migratory birds that are wetland-reliant or species at risk, and biodiversity. The Panel also concludes that the Project, in combination with past, present, and reasonably foreseeable future projects, would likely result in significant adverse cumulative effects on wetlands; old-growth forests; traditional plant potential areas; wetland-reliant species at risk and migratory birds; old-growth forest-reliant species at risk and migratory birds; caribou; biodiversity; and Aboriginal TLU, rights, and culture.

[25] The Panel understands that a large loss (over 10 000 hectares) of wetlands would result from the Project, noting in particular that 85 per cent of those wetlands are peatlands that cannot be reclaimed. The Panel further understands that wetlands provide important habitat for many migratory birds and species at risk. Based on the evidence presented, the Panel could not conclude that the remaining wetlands in the RSA would be sufficient to alleviate the effects of wetland habitat loss in the LSA. The Panel concludes that the Project would have high-magnitude, long-term, and likely irreversible effects on wetlands that are in an area nearly surrounded by, and thus affected by, other existing and approved oil sands mines. The Panel has determined that due to the adverse effects on wetlands in the LSA, species that rely on these habitats would be significantly affected. The Panel finds the effects on species reliant on wetlands to be high in magnitude, regional in scope, long-term, and potentially irreversible. The Panel also finds that significant cumulative effects on wetlands and wetland dependent species are likely in the RSA.

[26] The Panel finds that there would be high-magnitude, long-term, but possibly reversible cumulative effects on old-growth forest in the far future (2165). The Panel believes that Shell's estimation of remaining old-growth in the RSA is, at best, uncertain, and thus using the precautionary approach the Panel concludes that there would be significant cumulative effects. The Panel also believes that reclamation will not sufficiently mitigate the effects on species at

risk and migratory birds that rely on old-growth forest because of the substantial amount of time needed to re-establish habitat. The Panel has also determined that there would be significant adverse cumulative effects on species that rely on old-growth forests.

[27] The Panel finds that most of the high and moderate traditional plant potential in the LSA will be lost during the construction and operation phases and that after closure and reclamation the high and moderate traditional plant potential will decrease in the LSA by 7 and 52 per cent, respectively. Given that most of the Project area will not support traditional plants for several generations, the Panel also considers the effects to be long-term. The Panel notes that some traditional plants may never re-establish because they occur on wetlands that cannot be reclaimed. The Panel also notes that although Shell's planting prescription for achieving the desired post-reclamation range of ecosite phases includes some traditional plants, Shell largely relies on natural ingress and that there is limited opportunity to place topsoil and subsoil directly. For these reasons, the Panel finds that there would be significant adverse project effects on traditional plant potential areas. The Panel also concludes that the Project would have significant adverse cumulative effects on traditional plant potential in the RSA because of the significant levels of disturbance predicted for areas of high and moderate traditional plant potential, the long time lag between disturbance and reclamation, and the uncertainty associated with wetlands reclamation.

[28] The Panel notes that a substantial amount of habitat for migratory birds that are wetland or old-growth forest dependent will be lost entirely or lost for an extended period. The Panel finds the project effects on wetland and old-growth forest-reliant migratory birds to be moderate in magnitude, regional in extent, long-term, and potentially irreversible given that some habitat types cannot be reclaimed. The Panel concludes that these effects would be significant. The Panel further concludes that there would be significant cumulative effects on wetland and old-growth forest-reliant migratory birds, mainly as a result of the effects on habitat loss of past, present, and future projects in combination with the Project.

[29] The Panel notes that caribou, a species at risk that appears to be declining to extirpation in some herds, are traditionally and culturally important to Aboriginal people. The Panel finds that there has been and would continue to be significant adverse cumulative effects on caribou largely due to the catastrophic loss of caribou habitat from the preindustrial case (PIC) to the application case. The Panel concluded that Project effects would likely result primarily from a potential increase in predation on caribou in adjacent areas due to the increasing loss of habitat for caribou predators (e.g., wolves) within the Project LSA.

[30] The Panel has assessed the effects on biodiversity at the species, ecosystem, and landscape levels. The Panel believes that there appears to be a high potential for significant loss of biodiversity based on overall wildlife habitat loss, unproven methods for reclamation of peatlands and old-growth forest, and the long time lag between disturbance and reclamation. The Panel finds a high-magnitude, long-term, potentially irreversible effect on biodiversity at the LSA scale and concludes that it is a significant effect. The Panel also finds that there would be significant adverse cumulative effects on biodiversity in the RSA.

[31] The Panel is concerned about the lack of mitigation measures proposed for loss of wildlife habitat in the LSA that have been shown to be effective, particularly for wetland and old-growth habitat used by species at risk and migratory birds. The Panel believes that without

additional mitigation, there will be significant adverse effects on species abundance and diversity. The Panel believes that these adverse project effects, if not adequately mitigated, will contribute to adverse effects on biodiversity as well. Given the predicted declines in biodiversity in the RSA, the degree of error associated with Shell's estimates, the loss of habitat for species at risk, the uncertainty associated with habitat reclamation, and the lack of mitigation shown to be effective, the Panel finds a significant adverse effect on biodiversity in the RSA as a result of the cumulative effects of the application case and the planned development case (PDC) compared with the PIC. Despite uncertainty around appropriate thresholds to be used, the Panel believes that cumulative effects on wildlife observed in both the application case and PDC in the Project area have exceeded or are approaching some of the proposed thresholds, resulting in significant adverse effects on biodiversity. Although the Panel recognizes that *LARP* and other regulations and policies of the government of Alberta do not currently mandate the use of conservation offsets in the oil sands region, given that there are few options available for avoiding or minimizing the adverse effects of large surface mines, the Panel believes that the use of conservation offsets may be necessary.

[32] The Panel recognizes that numerous issues and challenges are related to the regional environmental effects of oil sands development. It is clear that critical issues about oil sands development are increasingly not project specific, and successful management of these issues is often not the sole responsibility of an applicant or proponent. As has been the case with other recent decisions on mineable oil sands development, many of the concerns and issues related to this proposal have to do with the pace of development of the mineable oil sands and the capacity of the regional environment to absorb these developments without creating effects that result in further development not being in the public interest. The Panel believes that a more integrated and comprehensive approach is required to adequately address cumulative effects of mineable oil sands development. While the *LARP* is an essential first step, its value will be fully realized only when all of its frameworks and thresholds are in place and being applied. The Panel encourages the government of Alberta to continue the processes associated with implementation of the *LARP* on an urgent basis.

Effects on Aboriginal Traditional Land Use, Rights, and Culture

[33] The Panel finds that the Project will result in the loss of lands and some resources used for TLU activities and that this will affect some Aboriginal people who use the Project area. The Panel finds that the mitigation measures proposed by Shell are not sufficient to fully mitigate these effects. The Panel believes, however, that project effects alone are unlikely to destroy or fundamentally alter the ability of the Aboriginal groups to practise TLU activities or to exercise their rights. The Panel therefore finds that project effects, while adverse, are not likely to be significant.

[34] In contrast, the Panel finds that project effects, in combination with the effects of other existing, approved, and planned developments and other disturbances in the region surrounding the Project are likely to result in significant adverse cumulative effects on Aboriginal TLU, rights, and culture. The Panel finds that significant areas have already been or will be lost for the purposes of TLU as a result of existing, approved, and planned activities. The Panel also finds that natural disturbances and other resources important for the practise of Aboriginal TLU, rights, and culture such as wetlands, old-growth forests, traditional plant potential areas, migratory birds, and wildlife species, such as caribou, have been or will be subject to significant

adverse cumulative effects. The Panel recognizes that disturbed areas will eventually be reclaimed, but this will not occur for many years, some types of habitat cannot be reclaimed, the landscape will be significantly altered, and some species loss may be irreversible. The long-term and possibly irreversible nature of these effects has significant implications for the sustainability of traditional ecological knowledge, TLU practices, Aboriginal and treaty rights, and culture.

[35] The Panel believes that determining the significance of project and cumulative effects on TLU and on Aboriginal and treaty rights and culture is a complex exercise that cannot be done simply by looking at the availability of the required resources and access to them. A thorough and proper assessment requires an understanding and integration of a host of issues, including effects on the availability of and access to the resources important to Aboriginal people and the combined effects of noise, odours, barriers to access, perceived contamination of resources, socioeconomic effects, cultural practices, and other factors that influence the choices of people about whether to engage in TLU activities. In addition, the number and variety of projects and activities occurring in the oil sands region, the multiplicity of TLU, rights, and cultural practices associated with the various Aboriginal groups, and a lack of consensus on the appropriate methodology and thresholds for determining when significant adverse effects on Aboriginal TLU, rights, and culture might be occurring make it challenging for individual project proponents, as well as panels such as this one, to complete these assessments. The Panel agrees with Shell and the Aboriginal groups participating in this review that completing cumulative effects assessments on a regional basis, rather than on a project-by-project basis, would be more effective and would reduce the potential for individual project cumulative effects assessments to produce inconsistent results.

[36] It is apparent to the Panel that the mitigations being proposed by individual project proponents are not effective at avoiding significant adverse cumulative effects on TLU in the Project region. The Panel acknowledges that the intent of the *LARP* is to take more of a cumulative-effects-based approach to managing environmental effects in the Lower Athabasca Region, but notes that the *LARP* does not specifically address TLU issues. Instead, the *LARP* provides for continued consultation and engagement with Aboriginal peoples to help inform land and natural resource planning in the region. Several of the Aboriginal groups expressed concern that the *LARP* does not address their concerns and does nothing to ensure ongoing traditional use of the land or to protect their Aboriginal or treaty rights. The absence of a management framework and associated thresholds for TLU makes it very difficult for Aboriginal groups, industry, and panels such as this one to evaluate the impact of individual projects on TLU. The Panel believes that to inform land use planning and allow better assessment of both project and cumulative effects on Aboriginal TLU, rights, and culture, a TLU management framework should be developed for the Lower Athabasca Region. The Panel recommends that Alberta develop and implement a TLU management framework for the Lower Athabasca region as a component of the *LARP*. The Panel recommends that the government of Alberta develop this framework with the involvement of all of the Aboriginal peoples who practise their rights in the oil sands region and who are affected by industrial development.

[37] All of the Aboriginal groups that participated in the hearing raised concerns about the adequacy of consultation by Canada and Alberta, particularly with respect to the management of cumulative effects in the oil sands region and the impact of these effects on their Aboriginal and treaty rights. In its submissions to the Panel on the questions of constitutional law, Canada and Alberta both advised the Panel that Crown consultation with Aboriginal groups was not complete

and that the Panel's report would inform the Crown's subsequent decisions about Aboriginal consultation. The Panel notes that it has determined that the Project may affect Aboriginal TLU, rights, and culture and that the cumulative effects of existing, approved, and planned development on Aboriginal TLU, rights, and culture are likely to be significant. The Panel recommends that Canada and Alberta each consider the Panel's findings in this report when it assesses the adequacy of Crown consultation that has occurred to date in relation to the Project, and when it considers what further consultation may be needed or desirable in order to complete their respective consultation obligations to affected Aboriginal groups.

Section 5 of *CEAA, 2012*

[38] Conclusions, mitigation measures, and recommendations related to section 5(1) of the *CEAA, 2012* in this report can be found in the following sections: No Net Loss Plan; Effects of Tailings Ponds on Migratory Birds; Diversion of the Muskeg River; Effects on Wetlands; Effects on Old-growth Forests; Effects on Traditional Plant Potential Areas; Effects on Wildlife and Their Habitat; Human Health; Physical and Cultural Heritage Resources; Capacity of Renewable Resources; and Effects on Aboriginal Traditional Land Use, Rights, and Culture. These sections provide the Panel's findings on

- the effects on fish and fish habitat, and migratory birds; and
- with respect to Aboriginal peoples, the effects in Canada of any change to the environment in health and socioeconomic conditions, physical and cultural heritage, or the current use of lands and resources for traditional purposes, and to any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance.

[39] Conclusions, mitigation measures, and recommendations related to section 5(2) of the *CEAA, 2012* in this report can be found in the following sections: No Net Loss Plan; Water Withdrawal from the Athabasca River; and Diversion of the Muskeg River. These sections provide the Panel's findings on the effects that may be caused to the environment and are directly linked or are necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out of the project. For this Project, the federal regulatory approvals that may be issued are those required by the Department of Fisheries and Oceans and Transport Canada.

INTRODUCTION

Application(s)

[40] In December 2007, Shell Canada Energy (Shell) applied to the Energy Resources Conservation Board (ERCB), in accordance with the *Energy Resources Conservation Act* (*ERCA*) and section 13 of the *Oil Sands Conservation Act* (*OSCA*), for an amendment to Jackpine Mine—Phase 1 (Phase 1) Approval No. 9756 to increase bitumen production at its Jackpine Mine (JPM). The Jackpine Mine Expansion Project (the Project) includes additional mining areas and associated processing facilities, utilities, and infrastructure. Shell also applied to the ERCB to receive third-party oil sands material at the facilities for processing and to produce and ship oil sands material from the Project for processing at third-party facilities.

[41] Shell submitted an environmental impact assessment (EIA) report to Alberta Environment and Sustainable Resource Development (ESRD), under *Environmental Protection and Enhancement Act* (*EPEA*), for an amendment to and renewal of the Phase 1, 10-year operating approval (No. 153125-00-00 as amended). Shell prepared a single EIA to assess the combined effects of the Project and Pierre Rive Mine project (PRM). Shell also applied under the *Water Act* to amend and renew an existing licence to divert water for use at the Phase 1 Project and for a new licence to divert water from the Athabasca River and other surface and groundwater sources for the Project. Shell submitted a copy of the EIA to the ERCB and to the Canadian Environmental Assessment Agency (the Agency) as required by the *Canadian Environmental Assessment Act, 2012* (*CEAA, 2012*).

[42] The Project will involve

- expanding the Phase 1 mining area as shown in figure 1;
- building ore handling, conditioning, and bitumen extraction facilities, and a high-temperature froth treatment facility at the Phase 1 site;
- constructing a new external tailings disposal area (ETDA); and
- diverting 22 kilometres (km) of the main stem of the Muskeg River.

[43] Phase 1 is about 70 km north of Fort McMurray, Alberta. Shell expects that the processing capabilities of these modifications and additions will increase the average capacity of the facilities by approximately 15 900 cubic metres per day (m^3/d) of dry bitumen, for a total average capacity of the expanded facilities of approximately 47 700 m^3/d of equivalent dry bitumen.

[44] ESRD determined that the EIA was complete in October 2010. The Project was subject to an environmental assessment under the *CEAA, 2012* because components of the Project required authorizations under section 35(2) of the *Fisheries Act* and section 5(1) of the *Navigable Waters Protection Act* (*NWPA*). On December 13, 2010, the federal Minister of the Environment referred the Project's environmental assessment to a review panel.

[45] The *OSCA*, the *EPEA*, and the *Water Act* require provincial approvals for the Project. The *Public Lands Act*, the *Municipal Government Act*, and the *Historical Resources Act* require ancillary approvals. The *Fisheries Act* and the *NWPA* require federal approvals.

Joint Review Process

[46] On September 20, 2011, the federal Minister of the Environment and the Chairman of the ERCB announced the *Agreement to Establish a Joint Review Panel for the Jackpine Mine Expansion Project* (the Agreement) for the Project (see appendix 3). The Agreement set up a three-member panel (the Panel), which will be referred to throughout this report as the Panel, to review the Project.

[47] The Minister and the Chairman appointed Mr. J. D. Dilay, P. Eng., as the Panel chair and Mr. A. Bolton, P. Geo., and Mr. L. Cooke as Panel members. The Panel members and secretariat members visited the site by helicopter on November 16, 2011.

[48] Subsequently, the Minister and Chairman signed an amendment to the Agreement on June 8, 2012, to coordinate the review process with the proposed Shell PRM. In July 2012, the *Canadian Environmental Assessment Act* (*CEAA*) was repealed and the *CEAA, 2012* came into force. The Panel's assessment continued under the process established in section 126 of the *CEAA, 2012* as if it had been referred to a review panel under section 38 of the *CEAA, 2012*. The Minister and Chairman signed an additional amendment on August 3, 2012, to account for the *CEAA, 2012* changes.

[49] Under the Agreement, the Panel must conduct its review in a manner that discharges the responsibilities of the ERCB under the *ERCA* and the *OSCA* as well as discharging the requirements set out in the *CEAA, 2012*. The Panel has all the powers and duties of a panel described in section 45 of the *CEAA, 2012* and of a division of the ERCB described in section 8 of the *ERCA*. The Agreement described the terms, conditions, and process to be followed by the Panel when conducting the joint review. The Agreement also described the scope of the environmental assessment. Table 1 summarizes the key steps of the review process and the associated timelines.

[50] Shell's EIA as submitted in 2007 used a base case, an application case, and a planned development case (PDC) defined as follows:

- Base case —existing and approved developments
- Application case—base case plus the Project
- PDC—application case plus planned developments

[51] On October 3, 2011, the Panel announced a public comment period on the adequacy of Shell's EIA and Application. On January 30, 2012, the Panel determined that the information provided by Shell was not sufficient to proceed to a public hearing and therefore sent supplemental information requests to Shell.

[52] In May 2012, Shell submitted a response to the Panel's SIRs and updated its assessment cases to account for revisions to the September 2011 project inclusion list and separation of the Project from the PRM effects. Shell referred to these cases as the 2012 base case, the 2012 JPME application case, and the 2012 PDC. Shell also included a preindustrial case (PIC) to address the Panel's SIRs, which it stated represents conditions before substantial industrial development of the region. Shell stated that because information for some components is lacking, the PIC is

based on the oldest data available, or on the most representative data available for each component.

[53] After receiving the additional information from Shell, the Panel announced a second public comment period to allow the public to review this information. On August 15, 2012, the Panel determined that more information was required and asked Shell to provide the information on or before September 7, 2012. Shell committed to providing the information, and the Panel issued the notice of hearing on August 17, 2012.

[54] The Panel's report uses the most recent data provided by Shell: therefore, references to the base case, application case, PDC, and PIC are all for the most recent cases, e.g., 2012 base case, 2012 JPME application case, 2012 PDC, and PIC.

Key dates in the review process

Date	Process Step
December 20, 2007	Application submitted
January 10, 2008	Application registered with ERCB
May 30, 2008	EIA update submitted
June 16, 2008	Joint notice of application issued (ERCB & ESRD)
October 24, 2008	Round 1 SIR sent (ERCB & ESRD)
December 18, 2009	Response to round 1 SIR
March 2, 2010	Round 2 SIR sent (ERCB & ESRD)
June 4, 2010	Response to round 2 SIR
July 21, 2010	Round 3 SIR (ESRD only)
August 9, 2010	Response to round 3 SIR
October 14, 2010	ESRD determined EIA complete
December 13, 2010	EIA referred to a review panel
May 27, 2011	Additional information submitted
July 22, 2011	Traditional knowledge (TK) and traditional land use (TLU) supplemental information submitted
September 20, 2011	Joint Review Panel established and agreement announced
October 3, 2011 to December 16, 2011	Public comment period on sufficiency of information submitted to date
November 15, 2011	Additional information submitted to the Panel by Shell
January 18, 2012	Additional information submitted to the Panel by Shell
January 30, 2012	Round 1 SIR by the Panel
March 1, 2012	Initial response to round 1 Panel SIR by Shell
May 16, 2012	Further response to round 1 Panel SIR by Shell
June 4, 2012 to August 3, 2012	Public comment period on sufficiency of information in responses to Panel SIR
June 8, 2012	Amended Panel agreement signed
August 3, 2012	Amendment #2 to Panel agreement signed
August 15, 2012	Round 2 Panel SIR
August 17, 2012	Notice of hearing issued

Date	Process Step
September 7, 2012	Response to round 2 Panel SIR by Shell
October 23, 2012	Hearing on questions of constitutional law
October 26, 2012	Panel ruling on questions of constitutional law
October 29, 2012 to November 21, 2012	Hearing
January 7, 2013	Hearing record closed

Participant Funding Program

[55] The Agency allocated $119 970[2] among the following five applicants to help with their review of the EIA and their participation in the public hearing: John Malcolm on behalf of the Non-status Fort McMurray/Fort McKay First Nation (NSFMFM) and Clearwater River Paul Cree Band No. 175 (Clearwater Band), Patricia Whiteknife, Amanda Annand, Sierra Club Canada (Prairie chapter), and the Oil Sands Environmental Coalition (OSEC).

[56] The Agency allocated $357 050[3] among the following five Aboriginal groups to help with their review of the EIA and their participation in the public hearing, including prehearing engagement and consultation activities with the federal government that are linked to the EIA: Athabasca Chipewyan First Nation (ACFN), Mikisew Cree First Nation (MCFN), Métis Nation of Alberta Association Region 1; Fort McKay First Nation (FMFN); and Fort McMurray #468 First Nation (FMMFN #468).

Questions of Constitutional Law

[57] Part 2 of the *Administrative Procedures and Jurisdiction Act* (*APJA*) states that a decision maker does not have jurisdiction to determine a question of constitutional law unless it is designated under the act as having authority to decide the question. Under the *Authorities Designation Regulation*, Alta. Reg. 64/2003, the ERCB is a designated decision maker with authority to decide all questions of constitutional law as defined in the *APJA*.

[58] Prior to the hearing, the Panel received notices of questions of constitutional law (NQCL) from the ACFN, the FMMFN #468, and the Métis Nation of Alberta (MNA) (made up of Métis Nation of Alberta Region 1, Métis Nation of Alberta, Fort McMurray Métis Local 1935, Fort Chipewyan Local 125, and named individuals). On October 18, 2012, the FMMFN #468 advised the Panel that the FMMFN #468 would not be pursuing or leading any evidence in support of its NQCL.

[59] The ACFN's NQCL posed the following questions:

> 1) Has the Crown in right of Alberta discharged the duty to consult and accommodate ACFN with respect to the potential adverse effects of the Project on ACFN's treaty rights, as mandated by [Treaty 8] and s. 35 of the *Constitution Act, 1982*?
>
> 2) Has the Crown in right of Canada discharged the duty to consult and accommodate ACFN with respect to the potential adverse effects of the Project on ACFN's treaty rights, as mandated by [Treaty 8] and s. 35 of the *Constitution Act, 1982*?

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[2] Money allocated does not necessarily equate to money disbursed (e.g., if a group did not participate in the hearing).

[60] The Panel considered that the MNA's NQCL posed the following question:

1) Has the Government of Alberta upheld its duty to consult with the Métis people whose rights will be impacted by this project? The MNA asserts that these rights exist and are and have been asserted by the MNA Region 1 throughout this process.

[61] The Panel provided a process for receiving written submissions concerning any matters that could bear on the Panel's jurisdiction over or consideration of the questions presented in the NQCLs. The Minister of Justice and the Attorney General of Alberta (Alberta), the Attorney General of Canada (Canada), Shell, and the FMMFN #468 filed written submissions. ACFN and MNA provided written submissions replying to Alberta's, Canada's, and Shell's submissions.

[62] After considering the written submissions, the Panel decided to hold a hearing session in Fort McMurray on October 23, 2012, to receive oral argument on the matters addressed in the submissions. All of the parties that filed written submissions concerning the NQCLs participated in the oral hearing, except for the FMMFN #468.

[63] On October 26, 2012, the Panel released a written decision stating that it did not have jurisdiction over the questions of constitutional law, and (in any event) that it would be premature for the Panel to make a finding on the questions of constitutional law. The Panel found that it does not have an express grant of statutory authority to consider the adequacy of Crown consultation in relation to the Project. Although the Panel is empowered by statute to consider questions of constitutional law relating to the matters before it in this proceeding or arising from its statutory mandate, the questions presented in the NQCLs do not arise from either. As a result, the Panel does not have jurisdiction over the questions of constitutional law raised in ACFN's and MNA's NQCLs.

[64] The Panel also found that even if the Panel had jurisdiction over the questions of constitutional law raised in the NQCLs, it would be premature for the Panel to make a finding on the adequacy of Crown consultation and make a decision in reliance on that finding (if the Panel concluded that consultation was inadequate). The Crown conduct that gives rise to the duty to consult will continue after this proceeding is completed and after the Panel has issued its report. The Panel's report will inform the Crown's subsequent decisions about constitutional consultation, and opportunities will exist for the Crown and Aboriginal groups to continue the consultation process. When that process is completed, and if the Crown's decision is that constitutional consultation is adequate, the Aboriginal groups will be entitled to challenge the Crown's decision if they are not satisfied with the results of that process.

[65] Notwithstanding that the Panel decided that it could not consider the questions of constitutional law because it did not have jurisdiction to do so, the Panel confirmed that it would consider all the evidence and argument relating to the potential effects of the Project on Aboriginal groups and individuals in accordance with the terms of the Agreement.

[66] The Panel set out its reasons for the foregoing decision in a letter from the Panel to all interested parties dated October 26, 2012 (see appendix 4).

[67] On October 26, 2012, ACFN filed a motion for an adjournment of the hearing to allow ACFN to apply to the Court of Appeal for leave to appeal the Panel's decision in relation to the questions of constitutional law filed by ACFN. Shell, Alberta, and Canada filed written

responses to the ACFN's motion. On October 29, 2012, the Panel heard oral submissions on ACFN's motion. On October 30, the Panel gave an oral decision denying ACFN's motion for adjournment.

[68] ACFN and MNA applied to the Alberta Court of Appeal for leave to appeal the Panel's decision of the Panel that it had no jurisdiction to consider their questions of constitutional law. The Court dismissed the applications on November 26, 2012. On April 11, 2013, the Supreme Court of Canada dismissed ACFN's application to obtain leave to appeal the Court of Appeal's decision.

Participant Involvement in the Review Process

Industrial Organizations

[69] Imperial Oil Resources Ventures Limited (Imperial) provided a statement of concern to ESRD in 2008 but later withdrew it. Fort Hills Energy Corporation (FHEC) provided a notice of intervention, which it later withdrew. Total E&P Canada Limited (Total) stated that it did not have any specific objections to the Project.

[70] Syncrude Canada Limited (Syncrude) provided a statement of concern to ESRD. It participated in the hearing by cross-examining witnesses and giving final argument. It did not oppose the approval of the Project but had some concerns about how the Project could impact Syncrude's operations and plans.

[71] Northland Forest Products Limited stated that it was concerned that the Project could adversely affect the long-term sustainability of its forest management unit, but it did not participate in the hearing.

Regional Municipality of Wood Buffalo

[72] The Regional Municipality of Wood Buffalo (RMWB) participated throughout the review process, including providing comments on the draft Agreement and comments on the sufficiency of Shell's information and responses to SIRs. It participated in the hearing by sitting a witness panel, cross-examining other interested parties at the hearing, and making final argument. RMWB withdrew its statement of concern on October 18, 2012, and said that it did not object to the Project but remained concerned about the socioeconomic impacts on the region as a result of oil sands development.

Aboriginal Groups (in alphabetical order)

[73] ACFN provided a statement of concern to ESRD in 2008. It provided written submissions to the Panel, including comments on the draft Agreement and comments on the response to SIRs by Shell, some of which it jointly submitted with MCFN. ACFN provided an *Integrated Knowledge and Land Use Report and Assessment for Shell Canada's Proposed Jackpine Mine and Pierre River Mine* (*IKLU Report*) that concluded the projects would cause significant adverse residual effects on ACFN's knowledge and use. ACFN asked that the Panel not approve the Project and that a five year moratorium be imposed on further oil sands development while proper planning is completed and put in place. ACFN participated in the hearing, including sitting witness panels, cross-examining Shell and other parties, and making final argument.

ACFN was concerned about project and cumulative effects in the oil sands region on its traditional way of life, Aboriginal and treaty rights, and culture. It expressed specific concerns about the Project's effect on the Muskeg River and about the adequacy of Crown consultation.

[74] The FMFN and Fort McKay Métis Community Association ([FMMCA] also known as Métis Local #63). Both parties are collectively referred to as Fort McKay. Fort McKay participated throughout the review process, including providing comments on the draft Agreement. On October 1, 2012 Fort McKay provided a written submission to participate in the hearing and requested that the Panel find that the Project is not, at this time, in the public interest pursuant to the *ERCA* and recommend to the Governor in Council (GIC) that no approvals be issued that would allow the Project to proceed, because the Project's significant and adverse effects, including its added contribution to the loss and infringement of Fort McKay's treaty and Aboriginal rights, are not justified in the circumstances, pursuant to s. 52 and 7 of *CEAA, 2012*.

[75] On October 26, 2012 and October 29, 2012 the Panel received letters from the FMFN and FMMCA stating that the FMFN and FMMCA wished to withdraw their objections to the Project on the basis that they entered into an agreement with Shell regarding the site-specific impacts of the Project. FMMCA indicated that it was withdrawing all recommendations from its October 1, 2012, submission, except for those related to cumulative effects management and Crown consultation and accommodation. The letters also stated that FMFN and FMMCA both had outstanding concerns regarding the cumulative impacts of regional development and the lack of consultation and accommodation by Alberta and Canada with respect to these impacts on their lands and Aboriginal and treaty rights. FMFN and FMMCA stated that they intended to participate jointly in the hearing by legal representation and final argument and reserved the right to file submissions, cross examine parties and call witnesses. Fort McKay did not provide a witness panel at the hearing but was represented by counsel who cross-examined interested parties and provided final argument.

[76] FMMFN #468 provided a letter of objection to the Project on October 2, 2008. It participated throughout the review process and provided written submissions on the sufficiency of Shell's information and response to the Panel's SIRs. Its legal counsel cross-examined interested parties and provided final argument; however, it did not sit a witness panel. FMMFN #468 expressed concerns that Shell did not provide funding for it to complete a technical review or traditional land use (TLU) study. It had concerns about project and cumulative effects on terrestrial resources and how these effects would impact its treaty rights and current use of land for traditional purposes. It also raised concerns about water quantity and quality.

[77] MNA represented members in the region from Lac La Biche to Fort Chipewyan, Alberta, Métis Locals 1935 and 125, and Métis individuals. MNA participated in the review process, including providing comments on the sufficiency of Shell's information and response to the Panel's SIRs. MNA participated at the hearing by cross-examining interested parties, providing witness panels, and providing final argument. MNA indicated that Shell's EIA was lacking in information about Métis traditional use. It was concerned about effects on its use of lands and resources, socioeconomic impacts, and Shell's and the Crown's consultation for the Project. It also raised issues related to capacity funding.

[78] MCFN submitted a statement of concern to ESRD in September 2008. MCFN participated in the review process by providing written submissions and comments to the Panel,

including comments on the draft Agreement and comments on the response to SIRs by Shell, some of which were jointly submitted with the ACFN. The MCFN provided an *Indigenous Knowledge and Traditional Use Report and Assessment for the Jackpine Mine Expansion Project and Pierre River Mine Project*, which concluded that the projects would cause significant adverse residual effects on MCFN's rights and indigenous knowledge. MCFN provided a hearing submission; however, it withdrew its statement of concern on October 2, 2012, stating that it did not object to the approval of the Project but that it remained concerned about cumulative effects in the Athabasca region and about Crown consultation. MCFN cross-examined the government of Canada and provided closing arguments at the hearing but did not present witnesses to speak to its filed evidence, nor was its evidence tested through cross-examination or questioning by Shell or the Panel.

[79] The Non-status Fort McMurray and Fort McKay First Nation (NSFMFM) and Clearwater River Paul Cree Band #175 (Clearwater Band) filed an objection to the Project with the ERCB on February 23, 2011. The NSFMFM and Clearwater Band objected to the Project on the basis that it would result in adverse impacts to their rights under section 35(1) of the *Constitution Act, 1982*. John Malcolm testified that he was the interim Chief of the NSFMFM and the Band Manager of the Clearwater Band and was authorized to represent the NSFMFM and Clearwater Band's interests with respect to consultation and environmental assessment of the Project. NSFMFM and Clearwater Band participated in the hearing by way of cross-examination, sitting a community witness panel, cross-examining Shell and other parties and making final argument. They were concerned about effects on their TLU, culture, socioeconomic conditions, air quality, and traditional food.

Members of the Public Attending the Hearing

[80] Dr. Anna Zalik and Isaac Osuoka provided a hearing submission. Dr. Zalik participated in the hearing to present evidence and to cross-examine Shell. Both individuals submitted that the Project should be denied approval on the grounds that it violates the treaty rights of ACFN and other Aboriginal peoples and the long-term rights of community members in the area. They also stated that the Project would have negative consequences for the regional and global environment and hence would not be in the best interests of Albertans and Canadians.

[81] Donna Deranger identified herself as an ACFN Elder. She made a statement at the hearing about water quality, traditional use, and socioeconomic and cultural issues. She did not want to be cross-examined.

[82] Mary Tourangeau stated that she was a member of FMFN. She attended the hearing to provide evidence that responded to another participant's evidence concerning Mr. Laviolette's use of her trapline. She was available for cross-examination.

Non-Governmental Organizations Attending the Hearing

[83] Keith Stewart of Greenpeace provided a hearing submission and participated in the hearing by presenting information and being cross-examined. His concerns related to cumulative greenhouse gas emissions for oil sands projects.

[84] OSEC provided a statement of concern to ESRD. It participated throughout the review process, including providing comments on the adequacy of Shell's information. It participated in

the hearing by way of written submissions, a witness panel, cross-examination, and final argument. OSEC submitted that the Project would cause significant adverse effects that would not be mitigated and that it was not in the public interest.

[85] Sierra Club Prairie participated in the hearing by presenting evidence and by cross-examining Shell's witnesses. It was concerned about the potential that a tailings containment facility may fail.

Non-Governmental Organizations not Attending the Hearing

[86] Several non-governmental organizations provided letters or written submissions to the Panel including Alberta Wilderness Association, Keepers of the Athabasca, Sierra Club[3], ForestEthics Advocacy, Environmental Defence, Nature Canada, World Wildlife Fund Canada, Earthjustice and Ecojustice, Natural Resources Defense Council, and Keepers of the Athabasca.

[87] Sierra Club's main concerns related to climate change effects of oil sands extraction, processing, and combustion and downstream effects of pipeline transport and refining. ForestEthics Advocacy's concerns related to effects on the boreal forest and the Athabasca River, and from tailings ponds and cumulative effects on wildlife and acid rain. It was also concerned about the increased number of pipelines and First Nation consultation by Shell and the federal government. Environmental Defence opposed the Project because of concerns about adverse environmental effects, including effects on wildlife, specifically caribou and migratory birds, water and air quality, and global warming. Nature Canada was concerned about the long-term effects on specific bird populations, and it questioned the adequacy of Shell's information. World Wildlife Fund Canada provided information on the absence of and need for an ecosystem base flow[4] (EBF) threshold for the Lower Athabasca River. Earthjustice and Ecojustice provided a submission on behalf of the Center for Biological Diversity, the Council of Canadians, Environmental Defence, ForestEthics, Friends of the Earth, the National Wildlife Federation, the Natural Resources Defense Council, and the Sierra Club. The submission discussed the cumulative effects of oil sands on migratory birds and caribou. The Natural Resources Defense Council submitted a letter opposing the Project, and it provided information on cumulative greenhouse gas emissions from the Project and the effects of oil sands mining on migratory birds. Keepers of the Athabasca provided a submission on cumulative effects of oil sands development. These groups were contacted by counsel for the Panel to determine if they intended to participate in the oral hearing, however, none of them indicated an intention to participate further in the process.

Comments from the Public

[88] The Panel received a form letter from many people urging the Panel to reject the Project. It focused mainly on air emission effects and tailings waste.

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[3] Sierra Club as stated here is a United States based national organization that provided separate submissions from Sierra Club Prairie.

[4] Ecosystem base flow — Refers to a threshold streamflow value below which a component of the aquatic ecosystem is believed to be under increased stress. (Alberta Environment and Fisheries and Oceans Canada. *Water Management Framework: Instream Flow Needs and Water Management System for the Lower Athabasca River...* February 2007.)

[89] The Agency received many e-mails entitled "No tar sands expansion" that opposed the Project, focusing on land and river disturbance and greenhouse gas emissions.

[90] Many people sent e-mails using a form that was not created or provided by the Panel, expressing various concerns with the Project. A few of these people participated further in the process (see appendix 1).

[91] Other people sent letters or e-mails to the Panel during the review process, mostly objecting to the Project.

[92] Clinton Westman provided a hearing submission but could not attend the hearing. His submission discussed assessing effects of oil sands development on Aboriginal people.

Government of Canada

[93] The Government of Canada participated throughout the review process, providing comments on the draft Agreement, sufficiency of information, and response to SIRs from Shell. Departments involved included Department of Fisheries and Oceans Canada (DFO), Transport Canada (TC), Environment Canada (EC), Natural Resources Canada (NRCan), Health Canada (HC), and Parks Canada Agency (Parks Canada). DFO, TC, NRCan, and EC provided submissions and attended the hearing with a witness panel. The Government cross-examined other participants and made final argument.

[94] Parks Canada stated that it manages and administers Canada's national heritage and preserves and presents the rich diversity of Canada's natural and cultural heritage to the benefit of Canadians and visitors from around the world. On December 16, 2011, Parks Canada provided a letter of comment on the sufficiency of the EIA, indicating that the EIA was not sufficient to go to hearings and highlighted areas where it was deficient which included not using a preindustrial case, not including the Athabasca River Delta portion of the Peace Athabasca Delta (PAD) as part of the regional study area (RSA), and not taking into account the *Canada National Parks Act*. It did not attend the hearing.

[95] HC stated that it is the federal department responsible for helping Canadians maintain and improve their health. HC participated by reviewing the Environmental Impact Statement (EIS) as well as providing technical comments on the additional information for the Project provided by Shell and determined that there was sufficient information to proceed to a public hearing. It did not attend the hearing.

[96] DFO stated that it administers and enforces the *Fisheries Act* and regulations and its mandate is to ensure the protection of fish and fish habitat. It stated that impacts to fisheries resources will be minimized if its recommendations, including mitigation measures, follow-up and monitoring, and fish habitat offsets are met. These recommendations can be found in appendix 7. DFO also remained concerned about cumulative effects on fish and fish habitat.

[97] EC stated that its mandate is to conserve and enhance the quality of the natural environment, including water, air, soils, sediments and biota, and that it has expertise, responsibility, and administration over legislation for migratory birds, federally listed species at risk, and pollution prevention. It had concerns about local and cumulative effects on species at risk and migratory bird habitat. It provided information on potential mitigation measures that

could be used to mitigate the effects on the habitat of these species. It commented on mortality of migratory birds in tailings ponds. EC also commented on water quality, climate change, aquatic health, air quality, greenhouse gas emissions, and environmental emergencies. EC's recommendations are set out in appendix 7.

[98] NRCan stated that it has expertise in physical hydrogeology, geotechnical slope stability, geohazards and geotechnical science, forestry, and tailings management. NRCan provided comment on groundwater quantity, slope stability of mine pit and waste disposal facilities, tailings management, and volatile organic compound (VOC) emission estimates from tailings. Its recommendations are set out in appendix 7.

[99] TC stated that it is responsible for federal transportation policies and programs and seeks to ensure that air, marine, road, and rail transportation are safe, secure, efficient, and environmentally responsible. TC stated that its mandate with respect to the Project is to ensure the public right of navigation under the *NWPA*. TC provided comment on potential effects related to the Muskeg River Diversion Alternative (MRDA) Mine Plan, the proposed bridge over the Muskeg River to access the north overburden dump, and the proposed modifications to the existing Muskeg River Mine Project (MRM) water intake system. Its recommendations are set out in appendix 7.

Government of Alberta

[100] The Government of Alberta completed its review and determined that the EIA was complete in October 2010. Alberta opted to not participate in or provide a written submission to the hearing but advised that it was prepared to provide written responses to any questions the Panel might have regarding environmental issues. The Government of Alberta was represented at the hearing for the session on questions of constitutional law.

Hearing

[101] The Panel began the hearing on questions of constitutional law on October 23, 2012, in Fort McMurray, Alberta and adjourned the same day.

[102] The Panel continued the public hearing in Fort McMurray, Alberta, from October 29 to November 16, 2012, and in Edmonton, Alberta from November 20 to November 21, 2012. Those who appeared at the hearing are listed in appendix 1.

[103] At the close of the hearing, a number of undertakings were outstanding. The undertakings were completed, and the Panel closed the hearing record as of January 7, 2013.

ISSUES

[104] The Panel considers the issues with the applications to be the following:

- Purpose
- Need for the Project
- Alternatives to the Project

- Alternative Means of Carrying out the Project
- Mine Planning and Resource Conservation
- Surficial Deposit Dewatering and Basal McMurray Aquifer Depressurization
- Devonian Geohazard
- Bitumen Recovery and Operating Criteria
- Asphaltene Rejection
- Solvent Loss and Release of Untreated Froth Treatment Tailings
- Tailings Management
- Accidents and Malfunctions
- Noise
- Air Quality
- Greenhouse Gas Emissions
- Climate Change Considerations in the Environmental Assessment
- Change to the Project Caused by the Environment
- Water Withdrawal from the Athabasca River
- Potential Effects on Groundwater from Process Affected Water
- Diversion of the Muskeg River
- Use of End Pit Lakes
- Effects on Surface Water Quality
- No Net Loss Plan
- Effects of Tailings Ponds on Migratory Birds
- Methods Used to Assess Effects on Terrestrial Resources
- Effects on Wetlands
- Effects on Old-growth Forests
- Effects on Traditional Plant Potential Areas
- Effects on Wildlife and Their Habitat
- Effects on Biodiversity
- Reclamation
- Human Health

- Physical and Cultural Heritage Resources
- Social and Economic Effects
- Capacity of Renewal Resources
- Effects on Aboriginal Traditional Land Use, Rights, and Culture
- Regional Effects

[105] In reaching the determinations contained in this report, the Panel has considered all relevant materials constituting the record of this proceeding, including the evidence and argument provided by each party. Accordingly, references in this decision to specific parts of the record are intended to help the reader understand the Panel's reasoning relating to a particular matter and should not be taken as an indication that the Panel did not consider all relevant portions of the record with respect to that matter. The Panel further notes that as a general principle, if written material was filed in the proceeding and the submitter did not participate in the oral hearing so as to allow that material to be tested, the Panel has given that written material less evidentiary weight than other written material that was able to be tested during the oral hearing.

PURPOSE

Evidence

[106] Shell stated that its objective for proposing the Project was to fully develop its mineable lease holdings on the east side of the Athabasca River. Shell said that the Project would allow Shell and the Governments of Canada and Alberta to realize the substantial economic benefits that would flow from investing in the development of these resources. Shell noted that approval of the Project, coupled with the previously approved MRM and Phase 1 projects, would complete the development of its lease holdings on the east side of the Athabasca River.

[107] Interested parties raised no issues related specifically to Shell's description of the purpose of the Project.

Analysis and Findings

[108] According to the Agency's operational policy statement that addresses "need for," "purpose of," "alternatives to," and "alternative means", Shell was required to describe the purpose of the Project from its perspective. The purpose is defined as, "what is to be achieved by carrying out the project."

[109] The Panel finds that Shell fulfilled the requirements of the Agency's operational policy statement and *CEAA, 2012* by providing a clear description of the purpose of the Project.

NEED FOR THE PROJECT

Evidence

[110] Shell stated that it had an obligation to its shareholders to define and advance development of the Project lease holdings in economically viable ways. Shell also stated it had a responsibility to the people of Alberta to develop the resource in a timely and efficient manner. Shell noted continued development of the Athabasca Oil Sands would provide a secure, domestic source of crude oil, which can replace diminishing conventional supplies and offset a growing demand. Shell submitted that the Project is required to meet these needs and to allow Shell to extend the life of its existing operations and to integrate and optimize such existing operations in an efficient, economic, and environmentally acceptable manner. Shell further concluded that the Project would achieve the purposes of maximizing the value of the resource and providing a supply of bitumen as a source of energy products, for the benefit of Shell's shareholders, Albertans, and the broader public.

[111] Shell indicated that its investment in the oil sands would result in increased employment, income, business revenue, and government revenue. Shell also stated that there were no alternatives to or functionally different ways to meet the Project need.

[112] OSEC stated that when considering whether the Project was in the public interest, it was important to note that the bitumen that will be produced will be predominantly for export. It claimed that the bitumen would not be used to meet Albertans' or Canadians' needs.

Analysis and Findings

[113] According to the Agency's operational policy statement, Shell is required to describe the need for the Project from its perspective. Need for the project is defined "as the problem or opportunity that the proposed project is intending to solve or satisfy by establishing the fundamental justification or rationale for the project."

[114] The Panel recognizes that OSEC appeared to be of the view that production for export was less desirable than production to meet domestic needs.

[115] The Panel notes that production benefits such as royalties, taxes, and employment are important factors affecting Alberta's and Canada's economy regardless of where the production is used.

[116] The Panel finds that Shell adequately provided a description of the need for the Project as outlined in the Agency's operational policy statement.

[117] The Panel also finds that, from an AER perspective, there is a need for the Project, to allow Shell to recover the resource that is owned by the people of Alberta, so that the benefits can be realized by the people of Alberta and Canada.

ALTERNATIVES TO THE PROJECT

Evidence

[118] Shell stated that it had considered alternatives to the Project in accordance with the Agency's operational policy statement which requires that "any alternative must be capable of fulfilling the need and purpose identified for the project by the proponent." Shell noted that the operational policy statement also confirmed that the level of detail on alternatives should reflect the conceptual nature of the Project at this stage of the process.

[119] Shell concluded that the development plan described in its application represented the most practical, economical, and sustainable means of extracting the resource. Shell further concluded there were no alternatives to or functionally different ways to meet the project need and achieve the project purpose. Shell claimed a "no development" option was inconsistent with the need and purpose of the Project and therefore could not be considered an alternative.

Analysis and Findings

[120] According to the Agency's operational policy statement, Shell is required to describe alternatives to the project where alternatives to the project are defined as "the functionally different ways to meet the project need and achieve the project purpose." Analysis of alternatives to the project should describe the process the proponent used to determine that the project is technically, economically, and environmentally viable.

[121] The Panel is satisfied, from both an AER and Agency perspective, that Shell provided both its rationale for and details relating to technically, economically, and environmentally viable alternatives to the Project.

[122] The Panel accepts Shell's view that a "no development" option is inconsistent with the need and purpose of the Project. The Panel notes that Shell did not describe the criteria used for evaluating how it reached its "no development" conclusion. However, the Panel is of the view that, despite a lack of specific detail on how Shell evaluated its alternatives, Shell provided enough information to have adequately assessed alternatives to the Project.

[123] The Panel believes that Shell provided a rationale for its Project timing which meets the Agency's operational policy statement requirements.

ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

Evidence

[124] Shell provided alternative means analysis on select aspects of the Project including diversion of the Muskeg River, use of End Pit Lakes (EPLs), and no net loss plan (NNLP) compensation. These issues are addressed further in other sections of this report.

[125] Shell stated that the use of in situ methods of bitumen recovery, such as steam-assisted gravity drainage (SAGD), fireflood, and in situ upgrading, were not technically feasible. Shell indicated that the Project resource is too shallow and not amenable to SAGD. Shell assessed

other in situ technologies and found these alternatives were not sufficiently developed and entailed unacceptably high risk. Shell pointed out that the Project is an amendment to an existing operation and that the introduction of a different technology platform would be incompatible and would reduce opportunities to leverage synergies with existing operations. Accordingly, Shell did not consider in situ methods to be alternatives to the Project because existing techniques would not represent a timely, efficient, and economically viable way of developing the resource, nor would they maximize the value of the resource. Shell stated that it identified no other potential alternatives to the Project through its assessment.

[126] Shell stated that one of the alternative means of carrying out the Project related to the timing of Shell's potential future development. Shell stated that it had considered delaying its plans for development and increasing the time gaps between potential expansions. Shell rejected this approach in favour of a close-coupled expansion approach because Shell concluded that delaying the Project would erode the potential for economic value to be captured through development timing and workforce overlap. Shell stated that a gap between project developments at the JPM site would reduce the value of the opportunity by not being able to roll engineering, construction, precommissioning, commissioning, and start-up resources from one project to the next. Shell indicated that it had not considered the environmental impacts of delaying the Project for a number of years in its various scenarios of alternative means of carrying out the project.

[127] FMMFN #468 submitted that delaying the Project by ten years would have environmental benefits and that the likely future increase in the oil price, combined with uncertainties in pipeline capacity for the coming years, support delaying the Project. FMMFN #468 explained that if the Project were delayed, it would still be possible for Shell to share its mining resources (workforce, engineering, etc.) with the MRM, which would still be in operation.

[128] To address air quality and acid deposition, OSEC recommended a delayed start-up of operations until 2033 when estimated nitrogen dioxide (NO_2) emissions from existing and approved projects in the region would no longer exceed regulated air quality limits.

[129] Shell disagreed that the Project needed to be delayed until 2033, given NO_2 predictions in the EIA. Shell noted that NO_2 levels predicted in the local study area (LSA) were above the *Alberta Ambient Air Quality Objectives* (*AAAQO*) levels. For the RSA, Shell stated that it predicted exceedances in the application case but that these exceedances were a result of approved projects in the region. Shell stated that its modelled results were conservative. Shell said that the *Lower Athabasca Regional Plan* (*LARP*) air quality management framework says that modelling results are only to be used to inform investigation and planning. Shell noted that the Government of Alberta designed this framework to ensure that actual ambient concentrations stay below these levels in the region, and indicated that Alberta would require industry to adapt its plans, as necessary, to ensure that air quality in the region is protected.

Analysis and Findings

[130] According to the Agency's operational policy statement, Shell is required to describe alternative means for carrying out the Project. Alternative means are defined in the statement as, "the various technically and economically feasible ways the project can be implemented or

carried out including alternative locations, routes, and methods of development, implementation, and mitigation."

[131] The Panel believes that Shell provided a rationale for its Project timing that meets the Agency's operational policy statement and *CEAA, 2012* requirements. The Panel finds Shell's rationale for not delaying the Project in light of additional costs to Shell's operation to be sound.

[132] The Panel finds that Shell provided sufficient information on the alternative means of carrying out the Project and that Shell selected appropriate options.

[133] The Panel believes that a delay in the approval of the Project will not significantly contribute to the protection of the environment because air emissions will not be allowed under the *LARP* to exceed the maximums specified by the air management framework and that the Project, if approved, should not be delayed.

MINE PLANNING AND RESOURCE CONSERVATION

Evidence

[134] Shell said that it shares a common lease boundary with two approved oil sands projects—Syncrude Aurora South Mine and Imperial Kearl Oil Sands Project (KOSP).

[135] Shell stated that it has a cooperation agreement with Imperial dated March 4, 2009. This agreement states that both Shell and Imperial will employ the mid-ore mining solution along their common lease boundary, which can be seen in figure 1. According to the timelines presented, Shell will approach the lease boundary before Imperial. In following the mid-ore mining solution, Shell would remove all of the overburden on its side of the boundary, then remove enough overburden on the Imperial side of the boundary to allow Shell to mine the ore down to the mid-ore elevation at the boundary location. This would establish a pit wall that straddles the lease boundary, with ore remaining on the Shell side of the boundary, in the toe of the wall. Shell would then construct a berm along the toe of the wall and leave all of the remaining ore for Imperial.

[136] Shell stated that it also has a cooperation agreement with Syncrude dated March 20, 1997, for the areas in which Shell is planning to mine along the common lease boundary with Syncrude, which can be seen in figure 1. This agreement states that Shell will employ the mid-ore mining solution along the common lease boundary. The remaining ore would be left in place, as Syncrude is not planning to develop the area. Shell also said that it is working to reach an agreement with Syncrude for the South external tailings disposal area (ETDA) where Shell is planning a surface disturbance. However, no ore mining is set to take place on Shell's side of the lease boundary in the South ETDA area.

[137] Shell stated that it has no commercial agreement with FMFN for mining near their common lease boundary, which can be seen in figure 1. Since there is no agreement for cooperation across the lease boundary, all of Shell's development must occur on the Shell side of the lease boundary. The Muskeg River Diversion Channel (MRDC) would dictate the pit limit at the north end of the common lease boundary. Shell would leave a boundary pillar in place between the pit crest and the lease boundary at the south end of the common lease boundary.

[138] In closing arguments, Shell committed to working with all adjacent leaseholders to address any lease boundary issues that may arise.

[139] Shell further stated that it would work with both Syncrude and Imperial to coordinate reclamation and watershed drainage. Shell noted that if the issues cannot be resolved between the parties, the dispute will be brought to the AER for adjudication.

[140] Shell identified the potential failure mechanisms for its mine slopes, including slumping of saturated glacial materials, sliding on weak layers at residual strength, and flows in rich oil sands ore. Shell stated that the presence of weak layers in the mining sequence was the most important stability issue. Shell incorporated a preliminary setback distance of 150 metres (m) from pit crest to the toe of the overburden disposal area (OBDA), based on industry practice and experience at MRM. Shell applied a safety design factor of 1.1, which it agreed was close to the critical condition of 1.0. Shell noted that the setback of the OBDA to a mining pit wall was site specific and said that it would do a detailed geotechnical analysis at the location of each OBDA pit wall interaction.

[141] The North ETDA would be surrounded by mine pits as mining progresses on the Shell and Imperial leases. Shell established a 200 m setback from the North ETDA to accommodate the surrounding mining activities, based on an assessment of the foundation materials under the South ETDA dikes. Shell also provided a preliminary stability assessment of dike pit wall interactions to show that there was adequate setback.

[142] Shell indicated that the mine plan would involve mining through a part of the Muskeg River and that it would divert the river by an open channel at that point. Where the Muskeg River would not be mined through, Shell proposed a minimum 100 m setback from the undisturbed reaches of the Muskeg River to the pit crest. Where the pit wall is not constrained by an OBDA or an ETDA, Shell proposed 60 m operational setbacks.

[143] Shell said that it changed the Muskeg River diversion from a pipeline to an open channel and stated that it did not, at the conceptual stage, consider lining the open channel. However, Shell also stated that determining if lining is required would be a part of its detailed investigation program.

[144] NRCan stated that Shell did not justify its proposal for a near critical slope condition of 1.1 for its proposed waste dump and pit slope stability. NRCan stated that slope stability was a potential environmental and safety concern for both the pits and the tailings/waste disposal facilities. NRCan stated that it recognized that some of these detailed technical questions might be addressed by the proponent during regulatory permitting. NRCan recommended that the Panel consider requiring that Shell inform the AER on how it intends to address any unfavourable slope conditions.

[145] Shell stated that it based the design criteria on data from geotechnical laboratory testing from the MRM and Phase 1, regional data, and experience. Shell understood the need for site-specific information and detailed geotechnical analysis at both the construction and operation phases.

Analysis and Findings

[146] The Panel accepts Shell's and Imperial's agreement to employ the mid-ore mining solution to eliminate resource sterilization along their common boundary.

[147] The Panel accepts Shell's commitment to work with Syncrude on updating the cooperation agreement for the areas where Shell is planning to mine along the common lease boundary. The Panel also accepts Shell's commitment to reach an agreement with Syncrude on the South ETDA area where only surface placement is to occur.

[148] The Panel requires Shell to submit a lease boundary update five years before any disturbance along a particular common lease boundary, unless some other period is stipulated by the AER upon application by Shell. The lease boundary update should include any update to the agreement between the common boundary leaseholders, the mining or disturbance plan along the boundary, and any changes from the evidence given by Shell in this proceeding in relation to the boundary.

[149] The Panel believes that Shell's assessment of the preliminary pit wall designs and setbacks is satisfactory for planning purposes at the conceptual level. The Panel understands that Shell plans to carry out detailed site investigation and analysis before any earth work begins. The Panel notes that section 24 of the *Oil Sands Conservation Regulation* (*OSCR 24*) requires that Shell provide a detailed geotechnical design to the AER.

[150] The Panel is concerned about the stability of the pit wall for the MRDC between the toe of the North OBDA and the mine pit crest, given that Shell's design criteria is for near critical stability conditions. The channel adds a load and pore pressure that could cause potential instability. The Panel requires Shell to provide, for AER approval, a geotechnical interaction assessment of the North OBDA, the MRDC, and the pit wall before any earth work begins at the interaction area of the North OBDA, the MRDC, and the pit wall.

SURFICIAL DEPOSIT DEWATERING AND BASAL MCMURRAY AQUIFER DEPRESSURIZATION

Evidence

[151] Shell stated that before overburden stripping and mining operations, it must dewater surficial deposits that are present including overburden materials and the Pleistocene Channel Aquifer (PCA). Shell proposed to do so by draining shallow groundwater through surface trenches and removing water by pumping from water wells. Operational surficial deposit dewatering will also be required beside active mine areas to limit surface water inflows from adjacent undisturbed land into active mine areas. Shell stated that it will manage surficial deposit waters removed through these operations in an open-circuit system, returning them to the environment to maintain/supplement surface water flows.

[152] Shell stated that it must also depressurize the Basal McMurray Aquifer underneath the ore zone to facilitate safe mine operations and to limit water ingress into active mining areas. It stated that groundwater removal using pumping wells will lower the groundwater level to a safe level below the base of the mine. Water within the Basal McMurray Aquifer may have naturally

poor quality and therefore will be handled within a "closed-loop" system to prevent those poor-quality waters from potentially impacting the surrounding environment.

[153] Dewatering and depressurization will result in a period of decreased groundwater levels and alterations in groundwater flow patterns near the Project during operations and into the post-closure period. Potential effects of the decline in groundwater levels include a reduction of groundwater discharge to surface water bodies, including wetlands and the Muskeg River and its tributaries. Specifically, Shell predicted that lenticular and patterned fens at the north end of the proposed development would experience water level drawdown between 0.1 m and more than 1.0 m as a result of dewatering, which is discussed further in the Effects on Wetlands section. Reduced groundwater discharge and lowered groundwater levels could potentially affect surface water flows and vegetation. MCFN, ACFN, and Fort McKay expressed particular concern over those effects and about their ability to continue pursuing their traditional lifestyles.

[154] Shell stated that it completed conservative groundwater modelling at both the regional and local scales to evaluate the potential effects of dewatering and depressurization. It constructed those models with regional data, available site-specific data, and commonly accepted values presented in scientific literature. It built into its models the assumption that all dewatering and depressurization activities will occur simultaneously but said that in reality, those operations will be progressive, operating ahead of the mining face, and ceasing after mine operations have passed and backfilling is completed.

[155] Shell stated that its groundwater modelling demonstrated that groundwater level drawdowns of more than 0.1 m in surficial deposits will mainly be confined to the LSA. However, there is the potential for this level of drawdown to extend beyond the LSA towards the west and north. Substantially greater groundwater level drawdowns will happen near the pumping locations. Shell anticipated decreases in discharge to surface water bodies near the Project. To mitigate reductions in surface water flows, it will release water from the open-circuit water collection system to the surface water system to maintain minimum flow levels.

[156] Shell indicated that dewatering of the PCA by adjacent operations could also affect groundwater levels in the LSA. Shell stated that dewatering the PCA at Phase 1 and the KOSP would cause groundwater level drawdowns of less than 20 m in an area up to 2 km from the southeastern boundary of the LSA. Shell stated that it did not predict any residual overburden dewatering effects for the LSA after dewatering ceased at the Aurora South and KOSP mining areas by 2065.

[157] Shell stated that groundwater modelling indicated a potential decline in groundwater levels of 0.01 m near the McClelland Lake Wetlands Complex (MLWC); this would be a minimal impact within natural variability and would not require mitigation. FHEC expressed concern that the Project could directly impact its protection plan for the MLWC, which was a requirement of *AER Decision 2002-089* for the Fort Hills Oil Sands Project (FHOSP). Shell did not agree that the proposed Project would impact FHEC's plan, and committed to ESRD that it would establish a monitoring program before mining the northern parts of the Project. The monitoring will allow Shell to develop mitigation plans before advancing mining activity into that area, if required. Shell indicated that it currently has groundwater monitoring piezometers installed on the north end of the Project development area.

[158] Shell stated that its models showed that drawdown of groundwater levels in the Basal McMurray Aquifer will remain largely within the lease area but will extend beyond that boundary to the west and south because of the continuity of the aquifer unit in those directions. However, it predicted that depressurizing the Basal McMurray Aquifer will not result in reduced flow in the Athabasca River, which is more than 10 km to the west.

[159] On the basis of the results of its groundwater models, Shell predicted that groundwater levels and flow patterns in areas not directly disturbed by mining will largely return to pre-mining conditions once dewatering and depressurization stops. Shell said that it will manage groundwater levels and flow patterns within disturbed areas through design of the closure landscape. In those areas, it will control groundwater conditions by managing groundwater levels and directing flows towards the EPLs.

[160] NRCan stated that Shell had done its numerical modelling and impact assessments appropriately, and the results seem to reasonably predict future conditions. However, NRCan concluded that there is a lack of field data/evidence to support simulated predictions. NRCan noted that Shell used few sources of local hydrogeological data to construct the models, assigned single values to geological units that are extensive in area, and used literature values in some situations. It said that there was a potential for large errors in groundwater levels, in the range of a few metres, which might be acceptable on the regional scale, but could result in important impacts at the local scale.

[161] NRCan recommended that Shell conduct groundwater monitoring to confirm its predictions of the groundwater models. NRCan recommended that Shell be required to review its groundwater models regularly and update them as more site-specific monitoring data becomes available, to verify the predictions of the current models, and to increase confidence in the results of future updated models.

[162] Shell agreed with NRCan's recommendation to regularly update hydrogeology models using collected field data, and indicated that it will incorporate the Project area into existing Phase 1 models when supporting data is available.

[163] Shell stated that it had a drilling program in progress to further understand the extent of the PCA. Shell said that it would require additional information on the PCA to design an appropriate dewatering program that would dewater the PCA effectively. Shell further stated that it would implement a groundwater monitoring program prior to operation of the Project to establish baseline conditions and provide for informed mitigation of dewatering-related effects. Shell said that it would continue to work cooperatively with both Syncrude and Imperial to ensure that proposed mitigation measures for the PCA remain appropriate.

Analysis and Findings

[164] With respect to groundwater modelling, the Panel finds that although Shell had limited site-specific data available to it for the construction of its models, it made adequate use of available data and used appropriate professional judgment and scientific literature data in lieu of site-specific data. The Panel understands that collection of site-specific data is challenging at the early stages of project planning, but it also notes that adequate site-specific data is crucial for appropriate mine planning and that more site-specific field data will be collected in the future. Regular updating of the models with field data will allow the simulated results to be confirmed

and predictions of the current models to be verified. The Panel accepts Shell's commitment that it will incorporate the Project into existing Phase 1 models once more site-specific data is available.

[165] The Panel recommends to ESRD that it require Shell to update its groundwater models when field data is available, and to inform affected stakeholders of any significant changes to model predictions resulting from the incorporation of site-specific data.

[166] On the basis of the evidence before it, the Panel finds that the potential effects of dewatering and depressurization would be largely limited in magnitude and duration, with the exception of the potential effects on the lenticular and patterned fens immediately north of the proposed development (discussed further in the Effects on Wetlands section). Notwithstanding effects on the lenticular and patterned fens, the Panel believes that Shell has proposed appropriate mitigation techniques to maintain surface water flows such that they will not be negatively affected by dewatering activities. The Panel acknowledges that all dewatering activities, including the Basal McMurray Aquifer depressurization, will be subject to licensing under the *Water Act*, which includes associated monitoring and reporting requirements. The Panel agrees with Shell that its Basal McMurray Aquifer depressurization activities at the Project will not likely affect the Athabasca River.

[167] The Panel understands that there is no previous industry experience with mining through the PCA. It notes that Shell is currently working on plans for PCA dewatering and mining, as Phase 1 will be the first mine to conduct mining operations through such buried channels. The Panel believes that PCA groundwater level drawdown and mining has the potential to result in cross-lease drawdown, groundwater flow pattern changes, and mining safety issues. The Panel notes Shell's commitment to cooperate with adjacent leaseholders in the matter of cross-lease connectivity of the PCA and associated mining activities. The Panel requires Shell to provide an update on its plans for dewatering and mining through the PCA five years before mining operations reach the PCA. The update is to include a description of any changes that Shell intends to make when dewatering and mining the PCA as a result of Shell's experience at Phase 1.

DEVONIAN GEOHAZARD

Evidence

[168] In October 2010, Shell experienced ingress of deep saline aquifer water into Cell 2A of its MRM site while it was conducting base of feed ore clean up operations. The saline water ingress was contained within Cell 2A. Shell stated that the saline water ingress had stopped after reaching hydraulic head balance with the pore pressure in the deep aquifer. The incident resulted in some ore sterilization and a loss of storage space for tailings. Consequently, Shell had to revise its mining and tailings plans to accommodate the Cell 2A incident. Shell has not yet identified the failure mechanism that resulted in the ingress of saline water.

[169] The ACFN was concerned that the Project could detrimentally impact the quality of water in the Athabasca River as a result of potential Devonian limestone rupture and deposition of deleterious substances into the Athabasca River and its tributaries. The ACFN was also

concerned about the potential that rupture contamination from the deep Devonian aquifer would affect the water quality of pit lakes.

[170] Shell noted that the MRM Cell 2A incident had provided it with valuable experience preparing for and managing future incidents in the unlikely event that they occur. Shell noted that in the event of an ingress incident similar to Cell 2A, the impact could be ore sterilization, changes to the mine plan or tailings plan, and a requirement to plan mitigation measures to seal the ingress.

[171] Shell stated that it considered the environmental effects on local freshwater supplies and vegetation due to saline water ingress in the Project pits to be negligible because the expected stabilized water levels would be lower than the top of the McMurray Formation. Low permeability oil sands in the McMurray Formation would effectively contain any saline water that might enter a pit. Shell further stated that it had entered into agreements with a number of industry participants to share data to understand the regional Devonian geology better.

[172] Shell stated that it would carry out a site-specific risk assessment at the Project following its geohazard protocols. Shell identified a number of potential risk management activities that could be used to minimize the potential for future problems with saltwater ingress, such as establishing absolute pit bottom, leaving a buffer zone that leaves some ore in place, or grouting and sealing fractures or passageways before mining the ore.

[173] As a result of the Cell 2A incident, Shell initiated a Devonian geoscience program. Through this program, Shell developed a geohazard management protocol for MRM and Phase 1. The protocol includes identifying geological risk, assessing the risk potential, and executing plans with operational measures, where necessary. The protocol established absolute elevation below which no mining activity takes place. The protocol also recommends leaving an ore buffer zone in high risk areas.

[174] In the event that deep saline aquifer inflow occurs, Shell's geohazard management program would implement control measures such as sealing or grouting the water pathways and sand sequestration of the saline water in the containment cell/pond.

[175] Shell stated that it would complete its geohazard management assessment for the Project within one to two years after approval.

Analysis and Findings

[176] The Panel notes that the Cell 2A incident is the first of its kind in the oil sands and that no established procedure exists to manage incidents related to ingress of water from a deep, saline aquifer.

[177] The Panel notes that while Shell has some level of understanding of Devonian geology and deep aquifer conditions, Shell's information and interpretation does not include a detailed understanding of local site-specific conditions. The Panel understands that it is hard to justify detailed study when the study is very expensive and there was no past experience with an incident of a similar nature. The Cell 2A incident shows now that there is a need for detailed understanding of local bedrock (Devonian) geology and deep aquifer conditions. The Panel

commends Shell for entering into agreements with other operators on data sharing about Devonian geology.

[178] The Panel notes that any occurrence involving saline aquifer ingress may impact resource recovery, operational safety, and the environment. Therefore, proper proactive measures should be in place.

[179] The Panel believes that Shell's stated intention to complete a geohazard management assessment within one to two years of approval may be optimistic. However, the Panel accepts Shell's phased approach to assessing the Devonian geohazard in advance of mining operations. The Panel believes that the geohazard assessment should be a continuous process that requires site-specific study as a part of the mine planning and operational program. The Panel also believes that the level of understanding could be improved and thus a risk assessment could be adaptively implemented if site-specific Devonian geological characterization is put in place. The Panel requires Shell to provide an updated geohazard management plan as a part of its annual mine plan submission, commencing with the expansion mining operations.

BITUMEN RECOVERY AND OPERATING CRITERIA

Evidence

[180] Shell stated it based its selection of its bitumen mining and extraction process on the need to produce a diluted bitumen product that will meet pipeline specifications and downstream processing and marketing requirements. The process selected provides Shell the opportunity to integrate its expanded operations with existing facilities. Shell stated that the process and facilities will meet or exceed the bitumen recovery requirements of *AER Directive 082: Operating Criteria: Resource Recovery Requirements for Oil Sands Mine and Processing Plant Operations* (*Directive 082*).[5]

[181] Shell stated that since start-up of the MRM in 2002, it had been compliant with the bitumen recovery requirements of *Directive 082* at MRM for two years (2005 and 2006). Shell stated that it had implemented numerous bitumen recovery improvements at MRM, but it did not believe that these changes would be sufficient to achieve bitumen recovery compliance. Shell said that it was evaluating further modifications to improve bitumen recovery at MRM.

[182] Shell stated that it started Phase 1 in August 2010 and that the Phase 1 extraction design included improvements over MRM, including a longer slurry conditioning line, primary separation cell design improvements, and additional flotation capacity. Shell stated that Phase 1 did not meet the bitumen recovery requirements of *Directive 082* in 2011 due to instability throughout the first twelve months of operations. Shell expected Phase 1 to meet the bitumen recovery requirements of *Directive 082* for 2012.

[183] Shell stated that the Project extraction design was similar to that of Phase 1. Shell stated that it will incorporate improvements currently being made at the MRM and Phase 1 to help improve bitumen recovery performance for all oil sand grades. It said that it will use the

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[5] Replaces and supersedes *Interim Directive (ID) 2001-07: Operating Criteria: Resource Recovery Requirements for Oil Sands Mine and Processing Plant Sites*

knowledge gained from these two operations to improve the performance of the Project's facilities.

[184] Shell stated that there is a relationship between bitumen recovery and ore blend, specifically grade, clay fines, and ions in the ore. Shell believed that it has sufficient data to develop and execute a mine plan that will supply an acceptable plant feed that allows it to meet bitumen recovery requirements.

[185] Shell committed to submit to the AER, two years before construction, details of the bitumen recovery improvements that Shell will implement as part of the Project.

[186] Shell stated that it will provide measurement plans to the AER one year before plant start-up. Shell stated that it expects that the startup and commissioning plans for the Project will be required by the AER at least one year before plant start-up.

[187] Shell stated that it will pursue integration with and optimization of existing facilities. Shell stated that regulatory approval of the overall development plan, coupled with flexibility in the manner in which approved developments are executed, would be a prerequisite to enabling the most effective development.

Analysis and Findings

[188] The Panel notes that Shell failed to meet the bitumen recovery requirements of *Directive 082* at both MRM and Phase 1 in certain years, and that Shell did not expect to meet the bitumen recovery requirements at MRM with existing facilities but did expect to meet them at Phase 1 in 2012. The Panel reminds Shell that these criteria are the minimum acceptable level of performance, and it expects operators to design their plant facilities and mining operations to meet them.

[189] Shell's proposed Project extraction process is similar to that used by Shell at Phase 1. The Panel understands that Shell is evaluating a suite of recovery initiatives and that Shell will apply knowledge gained at Phase 1 to the Project's design. The Panel requires Shell to provide a bitumen recovery improvement plan for AER approval two years before construction. This plan must include details of all bitumen recovery improvements Shell intends to incorporate into its expanded Jackpine Mine plant (i.e., Phase 1 and the Project) design and mine plan.

[190] The Panel requires Shell to provide measurement plans for AER approval one year before the expanded Jackpine Mine plant start-up. These plans must include process and instrumentation diagrams, metering, sampling methods, analytical methods, and material balance procedures that satisfy AER measurement requirements.

[191] The Panel requires Shell to provide a commissioning and start-up plan for AER approval one year before the expanded Jackpine Mine plant start-up.

[192] Shell discussed the need for flexibility in the manner in which approved developments are executed and the need for an integrated approach. The Panel accepts this approach with the understanding that MRM, Phase 1, and the Project are all interconnected. Shell's MRM and Phase 1 are currently subject to high risk enforcement action for failure to meet bitumen recovery requirements. The 2012 enforcement action suspends all currently approved expansion

plans that relate to, or that are intended to achieve, increased bitumen production capacity at MRM and Phase 1. The enforcement action states that if and when Shell is able to demonstrate to the AER's satisfaction that both MRM and Phase 1 are consistently achieving the *Directive 082* bitumen recovery requirement, the AER will be prepared to consider rescinding the suspension outlined above. Therefore, the Panel directs that the Project will be subject to the same enforcement actions currently being applied to the MRM and Phase 1 approvals.

ASPHALTENE REJECTION

Evidence

[193] Shell stated that it will process bitumen froth using a high-temperature paraffinic froth treatment process. Shell stated that bitumen normally contains about 17 mass per cent asphaltenes and that the mixing of bitumen froth and solvent at a specific solvent-to-bitumen ratio results in the precipitation of asphaltenes. The final product is partially deasphalted bitumen containing small amounts of solids and water. The precipitated asphaltenes will be discharged with the tailings solvent recovery unit (TSRU) tailings to the tailings ponds or deposition locations.

[194] Shell stated that the current design basis of the high temperature paraffinic froth treatment process was to reject less than 10 mass per cent asphaltene based on bitumen production. Shell stated that the asphaltene rejection level was a balance between upstream bitumen recovery and final bitumen quality. The higher the asphaltene rejection, the higher will be the quality of bitumen produced and the lower will be the bitumen recovery. Shell stated that it needed the ability to deliver bitumen of a quality that was compatible with a broad range of upgraders, specifically those using hydroconversion or catalytic processes.

[195] Shell committed to limiting asphaltene rejection to 10 mass per cent based on bitumen production on an annual average basis, consistent with the existing Phase 1 approval. Shell stated that it would discuss changes to the rejection limit with the AER if it saw an opportunity to optimize value.

Analysis and Findings

[196] The Panel notes that Shell has proposed a process that would result in asphaltene rejection and disposal of asphaltenes as a component of the TSRU tailings stream. The Panel accepts that higher quality bitumen provides a more marketable product but is concerned about the rejection of asphaltene, which is a potentially usable resource. The Panel believes that asphaltene rejection should be minimized in order to maximize resource recovery and utilization and to minimize the amount of asphaltenes deposited in the tailings ponds.

[197] The Panel accepts Shell's commitment to limit asphaltene rejection to 10 mass per cent based on bitumen production on an annual average basis. The Panel requires as a condition of approval that Shell must provide to the AER annually, on or before February 28, a calculation showing the amount of asphaltene rejection based on bitumen production, for the previous year of operation. The Panel also requires that on an annual average basis, the amount of asphaltene rejection must be limited to 10 mass per cent based on bitumen production.

SOLVENT LOSS AND RELEASE OF UNTREATED FROTH TREATMENT TAILINGS

Evidence

[198] Shell stated that its froth treatment plant would include a two-stage, high-temperature countercurrent decantation process, a solvent recovery unit, and a two-stage TSRU. The TSRU would recover solvent from the froth treatment tailings before discharging tailings to the tailing ponds or deposition locations. Shell committed to limiting solvent losses from all sources to no more than four volumes per thousand volumes of bitumen production on an annual average basis. Shell committed to not discharge untreated froth treatment tailings to any tailings ponds or deposition locations during normal operations.

Analysis and Findings

[199] The Panel notes that it is important to recover the solvent used in the bitumen extraction process for health and safety, resource recovery, and environmental reasons.

[200] The Panel notes that on a monthly basis, operators have been able to demonstrate solvent losses of less than 4 volumes of solvent per 1000 volumes of bitumen production. However, this has not been demonstrated to be sustainable on an annual average basis. The Panel also notes that estimated emissions as a result of solvent losses of less than 4 volumes of solvent per 1000 volumes of bitumen production are not expected to result in the exceedance of the AAAQOs or result in adverse health effects.

[201] The Panel accepts Shell's commitment to limit solvent losses to no more than 4 volumes of solvent per 1000 volumes of bitumen production, on an annual average basis as is presently required by the AER for MRM and Phase 1. Therefore, the Panel requires as a condition of approval that on an annual average basis, Shell must limit site-wide solvent losses to not more than 4 volumes per 1000 volumes of bitumen production. This calculation must be based on site-wide losses and must include all solvent losses during all operating conditions.

[202] The Panel accepts Shell's commitment to not discharge untreated froth treatment tailings as is presently required for Phase 1 and MRM. Therefore, the Panel requires as a condition of approval that Shell not discharge untreated froth treatment tailings to the tailings ponds or deposition locations.

TAILINGS MANAGEMENT

Evidence

[203] Shell stated that it had expanded its Phase 1 tailings management plan to include the Project. The plan would

- implement three tailings technologies to capture fines by thickened tailings (TT), non-segregating tailings (NST), and mature fine tailings (MFT) centrifugation;
- place the MFT centrifuged cake on the TT and NST dedicated disposal areas (DDAs); and

- achieve annual and cumulative *Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes* (*Directive 074*) compliance.

[204] Shell stated that it required a new ETDA to accommodate expanded production. It said it will operate the new ETDA as a sand dump with a minimum volume of fluid tailings.

[205] Shell said that it would start placing its TSRU tailings on the JPM site subaqueously when the Project starts up. In addition, Shell stated that it would not transfer tailings between the JPM and MRM sites. Shell committed to have zero fluid tailings volume at closure. It would therefore not place any fluid tailings in EPLs.

[206] Shell stated that the Project thickener design was similar to that of Phase 1. Shell noted that the solids content of the Phase 1 thickener underflow was less than expected due to a lower fines content in the ore body. Shell stated that it had placed high priority on modifying the Phase 1 thickener to produce an underflow with higher solids content. Shell will continue to improve its understanding of fines in ore, which will benefit not only the thickener design and performance, but also contribute to overall operations, such as ore blending, bitumen extraction, and tailings management planning. Shell also stated that it would incorporate the knowledge it gained from existing thickener operations into the Project thickener design and operation.

[207] Shell stated that it will continue to collaborate with industry through Canada's Oil Sands Innovation Alliance (COSIA) to evaluate alternative tailings technologies and optimize their application. However, Shell stated that it would take almost a decade to develop a new technology from conceptual idea to commercial implementation.

[208] Shell based its Project EIA on subaqueous TSRU tailings placement. However, Shell noted that it treated the Phase 1 froth on the MRM site and placed the TSRU tailings subaerially, instead of subaqueously, on the beach of the MRM external tailings facility.

[209] Shell stated that although the ERCB had initially conditioned the MRM approval to require subaqueous TSRU placement, when Shell subsequently encountered operational challenges the AER granted an amendment to allow subaerial placement. Shell stated that it had a monitoring program in place for the MRM external tailings facility to confirm that subaerial placement was not causing odour problems. Shell indicated it would apply for approval of subaerial placement on the JPM site if that approach proved to be successful on the MRM site.

Analysis and Findings

[210] The Panel is concerned about the viability of the Project's tailings management plan since Shell has not been able to demonstrate the success of its thickener technology at its Phase 1 operation. All three fines capture technologies cited by Shell rely on the success of thickener technology. The Panel is concerned that thickener underperformance may hinder fines capture rate by TT. On the basis of Shell's experience to date, the TT deposit formed by a low solids content thickener underflow has been unable to meet the *Directive 074* strength requirements. The Panel is similarly concerned about Shell's fines capture rate by NST because off-spec NST produced by low solids content thickener underflow will not be able to meet the *Directive 074* strength requirement. Consequently, the fines capture rate by MFT centrifugation would be limited by the shortage of placement area because only the beach areas of TT and NST deposits

would have adequate strength for the centrifuged cake placement, instead of the whole areas of those deposits as planned.

[211] For Shell to fulfill its commitments if the thickener cannot produce a suitable product, it will need to implement alternative technologies with sufficient fines capture capacity in a timely fashion. The Panel is concerned about the potential delay of compliance with *Directive 074* because Shell indicated that it would take almost a decade to identify a technology and take it to full-scale commercial implementation.

[212] The Panel is also concerned that Shell's thickener underperformance would result in the TT deposit not developing into a trafficable deposit in a timely manner. It would then, potentially, be left as a soft deposit in an above-ground structure at the end of mining operation and would not be maintenance free.

[213] The Panel concludes that Shell's Project tailings plan is overly optimistic and may not be achievable. However, the Panel recognizes that Shell has made improving the Phase 1 thickener performance a high priority. Shell intends to continue improving its understanding of fines in ore and will incorporate the knowledge gained from existing operations into the Project's thickener design. Shell will also continue to develop other technologies to improve its tailings management. The Panel requires Shell to provide a tailings management plan for AER approval, two years before the expanded project start-up. The plan must indicate that Shell will be compliant with *Directive 074* from the time of start-up.

[214] The Panel acknowledges that Shell has applied for subaqueous TSRU tailings placement. The Panel is concerned that if Shell proposed to change to subaerial placement similar to MRM, the solvent in the TSRU tailings would be directly exposed to air, which might change the conclusions of the EIA. The Panel believes that monitoring for subaerial TSRU placement at the MRM site should include not only odour emissions, but also VOC emissions. The Panel notes that Shell would need to apply if it wished to change the TSRU placement on the JPM site to subaerial, and in doing so it would need to address whether that change affects the conclusions in the EIA.

[215] *Directive 074* is part of a larger initiative to regulate mineable oil sands tailings. It is the first step toward reducing fluid tailings and expediting the formation of trafficable deposits. Future policies, specifically the tailings management framework being developed by the Government of Alberta, will provide operators with further direction for managing and reclaiming oil sands tailings.

[216] Despite its concerns about the potential delay in the Project's tailings plan complying with *Directive 074*, the Panel recognizes that Shell's commitment to have no fluid tailings at closure surpasses *Directive 074* requirements in the long term. Shell's commitment is aligned with other recently approved mineable oil sands projects. Both the Joslyn North Mine project and FHOSP committed to eliminate fluid tailings completely at the end of mine life, and the AER conditioned its approvals to require such elimination. The commitment addresses one of the long-term objectives of tailings management: to minimize and eventually eliminate long-term storage of fluid tailings in the reclamation landscape. Therefore, the Panel requires Shell to have no fluid tailings at the end of the mine's life.

ACCIDENTS AND MALFUNCTIONS

Evidence

[217] Shell assessed potential environmental effects of accidents and malfunctions associated with Project activities and facilities, including hydrocarbon releases, mining activities, surface water incidents, air quality control, and migratory birds landing in tailings areas. For information on migratory birds landing on tailings ponds, see the Effects of Tailings Ponds on Migratory Birds section. Of the accident scenarios Shell evaluated, it considered only an accidental release of solvent to the tailings facility and a process upset causing emergency flaring as likely events, but it considered the environmental consequences of both of these scenarios to be low. Shell stated that hydrocarbon pipeline loss of containment and spill into a watercourse, ETDA dike failure, overburden disposal area failure into the Muskeg River, and tailings pipeline failure over a watercourse were of high environmental consequence. However, Shell said that the likelihood of these accidents actually occurring was remote to very unlikely.

[218] Sierra Club Prairie conceded that the risks of oil sands tailings containment failures are low but stated that they are far from remote. It believed that the worst single environmentally damaging event would be failure to contain a tailings dike and a resulting release of toxic tailings into the Athabasca River or its tributaries. It stated that many of the tailings ponds were next to water bodies, creating concerns about both massive failures and smaller leakages from existing tailings ponds and from future remediated or buried tailings.

[219] Shell stated that it modelled a worst-case scenario that demonstrated a failure would result in a peak flow of 1.65 m on the Athabasca River at Fort McKay about six hours after the breach, which is within the range of flood levels for the Athabasca River. Shell said that the worst-case failure would therefore not affect public health and safety.

[220] Shell considered whether and to what extent such a failure would affect communities, water bodies, and recreational sites. Shell identified linkages with Fort Chipewyan, Fort McKay leases, Kearl Lake, Jackpine Creek, Muskeg River, Athabasca River, Peace-Athabasca Delta (PAD), Wood Buffalo National Park, and all wildlife receptors. Shell determined that Fort McKay, Fort McMurray, trapper cabins, the Naumr River, Poplar Point, worker camps, MLWC, Isadore's Lake, and Quarry of the Ancestors would not be impacted if a dike failure occurred. Shell stated that the direction of the dike failure would determine which receptors would be affected. Shell determined that there would be little to no effect on people and moderate-to-high effects on environmental components and wildlife habitat, but no population-level effect on any of the wildlife species.

[221] Sierra Club Prairie did not believe that Shell appropriately examined the sensitive elements of the environment as requested by the Panel in its SIRs, and it said that a worst-case scenario would affect the Fort Chipewyan community and surrounding wildlife more adversely than Shell predicted.

[222] Shell stated that it invests a significant amount of time and money to ensure that preventative measures are in place. Shell noted that it has established an independent geotechnical review panel to assess the risk in the design and operation of the tailings dam. Other design measures that Shell committed to implement include

- designing the dam in accordance with the Canadian Dam Association (CDA) guidelines;
- having the design approved by ESRD;
- constructing the dam to accommodate heavy rain;
- having the dam constructed and assured by independent panels;
- operating, maintaining, and monitoring the dam in accordance with the Mining Association of Canada's (MAC) *Guide to the Management of Tailings Facilities*;
- having the dam reviewed by the AER annually; and
- conducting regular audits.

[223] Shell committed to a monitoring program to ensure that design conditions are met and to correct conditions as needed. Shell stated that it would monitor

- the water table to indicate dike stability;
- slope inclinometers to indicate stability;
- general dike condition;
- pond water levels to indicate potential for overtopping; and
- exit flows from drains for volumes, water quality, suspended sediments, and water chemistry.

[224] Shell stated that in the event of a failure, it would take immediate actions to

- implement its emergency response system;
- secure the immediate area and ensure workers are safe and accounted for;
- divert flows away from the ETDA and/or shut down tailings production;
- request aid support as required; and
- initiate remedial works as appropriate.

[225] Shell noted that there has never been a dam failure in the oil sands. Sierra Club Prairie rebutted that this was not correct because data collected by the International Commission of Large Dams indicated that there have been three major accidents in Canada's oils sands. Shell explained that these losses of containment were not the result of a tailings dike breach and should be considered "minor incidents."

[226] Sierra Club Prairie said that it would like to see improved accessibility to reports such as emergency preparedness plans; emergency response plans; operation, maintenance, and surveillance manuals; the annual tailings dam performance reports; and the five-year dam safety reviews. Sierra Club Prairie stated that it could not verify Shell's determination of no adverse effects because it was unable to review these documents. Shell stated that it does not publicly disclose the information contained in emergency response plans and safety audits because it could be used for mischief.

[227] Sierra Club Prairie noted that Shell had not completed a cumulative effects assessment (CEA) that considered a tailings dam breach. It recommended that Alberta and the federal government, with the engagement of industry, First Nations, and stakeholders, undertake a

rigorous CEA that include a quantitative analysis of the risk of oil sands tailings containment failure throughout the Athabasca watershed, with an analysis of consequent environmental effects and appropriate mitigation measures.

Analysis and Findings

[228] The Panel is satisfied that Shell has evaluated applicable accident and malfunction scenarios and has prepared reasonable contingency plans to prevent accidents and malfunctions. The Panel also believes that Shell has identified appropriate mitigation measures to address potential accidents and malfunctions, should they occur. The Panel finds that Shell provided information on sensitive elements of the environment and included these elements in its assessment of the effects of potential accidents and malfunctions.

[229] The Panel agrees that if a tailings dam failure occurred the effects would be catastrophic, long-term, beyond regional, and thus significant. However, the Panel also agrees that the probability of a failure is extremely low. Furthermore, the Panel finds that the likelihood of multiple failures occurring from multiple oil sands mines and resulting in a cumulative impact is extremely remote. Accordingly, the Panel finds that a CEA, as suggested by Sierra Club Prairie, is not necessary. The Panel is confident in these findings because tailings dams are designed, constructed, and operated in accordance with the CDA guidelines and MAC *Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities*, and because provincial regulators review and approve detailed geotechnical designs for tailings dams, emergency preparedness and response plans, and annual performance reports, and they require an independent five-year dam safety review for each dam. The Panel agrees that the losses of containment that have been reported in the oil sands are minor incidents and recognizes that the proven record of safe operation of tailings dams indicates a robust system of design, operation, and government regulatory oversight, and as a result the risk to public safety is extremely low.

NOISE

Evidence

[230] Shell presented a noise impact assessment (NIA) that concluded that the Project would meet the requirements of *Directive 038: Noise Control* (*Directive 038*). Shell's NIA indicated that effects from traffic and construction would be negligible. Shell's NIA also indicated that assessed wildlife species affected by noise will habituate to the disturbance effects of the Project and it predicted that disturbance effects would be negligible. Shell did not expect that outdoor noise levels from the three aircraft flights per day that it assessed would cause significant indoor noise fluctuations resulting in sleep disturbance.

[231] Shell based most of the sound power level information used in its NIA on theoretical calculations. Shell indicated that there was a possibility that the equipment and location of equipment in the NIA could be somewhat different, depending on the final engineering design and detailed mine plan. Shell also indicated that it would update the NIA to reflect changes to the bird deterrent system and to the future turnover to tier IV haul trucks. Fixed equipment will include any noise control needed to meet the *Alberta Occupational Health and Safety Act* (*OHSA*) design requirements.

[232] Shell indicated that it had not yet taken actual sound level measurements of the Phase 1 operations that began in August 2010. Shell committed to completing a post-construction monitoring report for Phase 1 in 2013, and stated it would be willing to accept this as a condition of approval. Shell also committed to completing a post-construction survey for the Project.

[233] ACFN indicated that noise effects from the Project include loss of enjoyment of its members' lands, practice of treaty rights, disturbance of bison from chronic noise, and intentional disturbance of migratory birds and flyways from bird cannons.

[234] Fort McKay stated that the cumulative impact of noise from present and future mining operations continues to be a concern for Fort McKay.

[235] NSFMFM and Clearwater Band expressed concern about wildlife and about noise effects of bird cannons on migration flyways.

[236] EC asked the Panel to recommend that Shell evaluate noise levels in residual habitat and implement mitigation measures to reduce noise effects to an average noise disturbance threshold of 48 decibel A-weighting (dBA).

Analysis and Findings

[237] The Panel finds that the NIA provided by Shell is technically complete. While the Panel acknowledges that the Project will result in an increase in noise in the area, the Panel believes that the noise mitigation measures proposed by Shell are appropriate.

[238] The Panel requires Shell to provide, within one year after expansion operations start-up, a post-construction, comprehensive sound monitoring survey of the Project, including measurements of expansion equipment, to verify compliance with *Directive 038*.

[239] The Panel requires Shell to provide an update to its NIA or complete a comprehensive sound monitoring survey to demonstrate compliance with *Directive 038* after its selection of new tier IV haul trucks.

AIR QUALITY

Project Effects

Evidence

[240] Shell stated that the Project's air emissions sources include natural gas-fired cogeneration units and boilers, diesel-fired mobile equipment fleet, and fugitive emissions. Shell confirmed that it was applying to use a natural-gas fired cogeneration plant to provide steam and electricity for the Project and that it was not currently seeking approval to recover asphaltene energy.

[241] Shell noted that the Project's stationary combustion equipment will have nitrogen oxide (NO_X) controls with the best available technology that is economically achievable. Shell stated that it would use ultra-low sulphur diesel fuel in its mine fleet and committed to purchasing mobile equipment that would meet the applicable NO_X management standards at the time of purchase.

[242] Shell characterized the 129 ambient air quality parameters it assessed in the application case as having a negligible to low effect with no significant adverse environmental effects.

[243] Shell predicted that the base case and application case operations would result in exceedances of the annual *AAAQO* for NO_2 in the LSA and RSA and at the Project's fence line. Shell maintained that the predicted exceedances were not caused by the Project's emissions but by the cumulative effects of multiple operations in the area. Shell noted that predictions at community receptors were below the NO_2 objectives.

[244] OSEC stated that the Project would be a significant source of NO_2 emissions. OSEC noted that Shell had modelled NO_X emissions based on the assumption that its mine fleet, and the mine fleet of all other operators, would be replaced by tier IV-compliant fleets by the end of 2024 at the latest. OSEC noted that Shell's predictions of future ambient air concentrations of NO_X were not conservative because Shell testified that it would not commit to ensuring that its mine fleet met tier IV standards by 2025. EC stated that the mine fleet would be a significant source of the Project's NO_X emissions, and noted that depending on the availability of tier IV trucks, Shell may have underestimated the Project's mine fleet NO_X emissions. EC recommended that Shell consider vehicle emission testing in its mine fleet management plan.

[245] Shell stated that its assessment of the mine fleet emissions was reasonable and conservative because it assumed that the highest annual mine fleet emissions would occur every year over the life of the Project.

[246] Shell noted that transition to tier IV trucks would likely occur by 2025. Shell acknowledged that if tier IV trucks were not available by 2025 as it had assumed, the emissions from its mine fleet would be higher and the resulting ground-level concentration would be higher than Shell predicted. Shell maintained that although it could not make a commitment that would tie it to a supplier's technology development, it would commit to continuing to work closely with the equipment suppliers to develop equipment that is more energy efficient and emissions friendly. Shell also noted that although it is not currently considering retrofitting its mine fleet to reduce NOx emissions, it would work toward reducing the size of its truck fleet, fuel costs, and maintenance and provide the highest reliability and uptime possible in order to maximize equipment efficiency and reduce emissions.

[247] OSEC maintained that Shell did not provide any information about what measures it would take to reduce mine fleet emissions if monitored air quality exceeded thresholds. OSEC stated that because Shell provided no mitigation, approving the Project would contravene the *LARP* air quality management framework. OSEC recommended that as a minimum, Shell be required to measure end-of-pipe emissions from its mine fleet and report those emissions annually.

[248] Shell stated that the region was already having odour incidents from existing projects. Shell predicted that there would be an increase in the number of hours in which the peak odour levels would exceed odour thresholds as a result of the Project. Shell stated that because this increase was minimal, the residents within the regional communities would not likely be able to notice any change in odour levels.

[249] Fort McKay expressed concerns about more odours, deteriorating air quality in general, and potential associated adverse health effects in its community. Fort McKay said that there was

a gap in regulations and standards to manage odours and urged the Panel to recommend to relevant governments that they implement odour regulations and standards forthwith. Shell stated that it would continue to support the monitoring of the air in Fort McKay.

[250] NSFMFM and Clearwater Band expressed concerns about dust emitted from the Project's mine face and tailings pond. Shell stated that its normal practice was to water its roads during spring, summer, and fall and that results from monitoring at Wood Buffalo Environmental Association (WBEA) station 9 indicated that dust was being kept to a minimum.

[251] Shell maintained that although Project contributions to regional air emissions were small, it would still do its part to help manage regional air quality and would commit to several operational standards as part of the Project, including

- meeting the best regulatory standards available for cogeneration units and boilers;
- conforming to the Canadian Council of Ministers of the Environment (CCME) *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above-Ground Storage Tanks*;
- identifying and controlling plant-wide fugitive emissions using the protocol recommended by the Canadian Association of Petroleum Producers (CAPP) *Management of Fugitive Emissions at Upstream Oil and Gas Facilities*;
- minimizing flaring and complying with *AER Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting* (*Directive 060*);
- meeting the emission standards that apply at the time of purchasing mine fleet vehicles, and regularly maintaining the mine fleet;
- monitoring truck idling, and implementing pit-stop practices to minimize idling during shift changes;
- using condition-based monitoring and maintenance rather than time-based maintenance to ensure optimal fleet performance;
- managing TSRU tailings deposition to maintain an annual average rate of 4 volumes of solvent per 1000 volumes of bitumen produced;
- managing slash burning according to Shell's Environmental Management System procedure; and
- watering roads during dry periods to control road dust.

[252] Shell predicted that all polycyclic aromatic hydrocarbons (PAH) compounds and metals would be below the *AAAQO* limits or other applicable criteria. Shell stated that it had conducted a fairly extensive modelling analysis in order to understand the effects of aerial deposition of PAHs and metals on water bodies. Shell concluded that the Project's air emissions would not result in any measurable change in water quality in the region.

[253] Shell estimated that the background potential acid input (PAI) levels would have already exceeded the critical loads of 18 lakes before there was any industrial development. Shell noted that 21 lakes would exceed critical loads in the base case. Shell maintained that no lakes

exceeded their critical loads as a result of the Project in the application case. Shell predicted that there would be negligible acidification effects on soil, vegetation, and water receptors and that none of the 414 model lakes would become acidified as a result of the Project.

[254] Shell maintained that it had designed the Project to result in less acid-forming emissions, and its environmental assessment was both consistent with regional guidance and conservative because it assumed that all developments would be operating at full capacity simultaneously, which is unlikely to be the case.

[255] OSEC noted that Shell had not identified how the Project would avoid increasing acid deposition, contrary to the *Acid Deposition Management Framework*. OSEC stated that the Project would cause exceedances of the limits in the *Acid Deposition Management Framework*, and it was not in the public interest to approve it. OSEC stated that approval should be granted only if there was a net-zero contribution to PAI.

Analysis and Findings

[256] The Panel notes that Shell predicted that all PAH compounds and metals were below the *AAAQO* levels or other applicable criteria.

[257] The Panel notes that there are predicted exceedances of the *AAAQO* for fine particulate matter ($PM_{2.5}$) in the base case and application case. The Panel notes Shell's argument that the predicted exceedances were due to existing and approved projects in the region, and there were no increases in predicted concentrations as a result of the Project's emissions.

[258] The Panel notes that air emissions are an important concern for a number of stakeholders and acknowledges Fort McKay's concern regarding odours. The Panel notes that although there is a lack of regulations or standards aimed specifically at odours, attention is paid to odour control by limiting emissions of odorous products, including fugitive ones, responding to odour complaints, and following up on the complaints. The Panel expects Shell to follow through diligently on its commitments regarding the Project's operational standards.

[259] The Panel believes that proponents of new or expanding oil sands schemes in Alberta need to be aware of reasonably foreseeable changes to current emissions standards and new environmental management frameworks and need to incorporate flexibility into project design to facilitate retrofitting of improved controls. As changes to current source emission standards are reasonably foreseeable and may need to be applied retroactively to ensure that *LARP* limits are not exceeded, the Panel expects that Shell, as well as proponents of new and expanding oil sands projects, will incorporate sufficient flexibility into their projects so that they can achieve compliance with future standards within a reasonable timeframe.

[260] The Panel is of the view that the Project is not likely to result in significant adverse environmental effects on air quality, provided that the mitigation measures and the Panel's recommendations are implemented.

Cumulative Effects

Evidence

[261] Shell stated that the Project's contribution to NO_X and sulfur oxide (SO_X) emissions would constitute less than 1 per cent of regional emissions. Shell predicted that the planned development case (PDC) operations would result in exceedances of the annual *AAAQO* for NO_2 in the LSA and RSA. Shell maintained that the exceedances would not be caused by the Project's emissions but by the cumulative effects of multiple operations in the area.

[262] Shell stated that its modelling showed that the *LARP* limits would be exceeded for NO_2 in the base case and therefore no exceedances of the *LARP* limits would be as a result of the Project. OSEC noted that Shell forecasted exceedances of the level 4 thresholds[6] for NO_2 established in *LARP*, with the base case already exceeding the annual limits. Shell noted that *LARP* was clear that modelling results were to be used for regional planning purposes and not for predicting exceedances. OSEC noted that *LARP* was intended to guide decision makers in deciding what activities should be allowed to occur in the area.

[263] OSEC stated that NO_X emissions have been steadily rising in the region, as confirmed by the WBEA monitoring stations. OSEC noted that in 2011, the WBEA Millennium monitoring station recorded annual NO_2 emissions at two-thirds of the *LARP* limit (30 micrograms per cubic metre [$\mu g/m^3$]), at which point immediate management action is required. OSEC stated that this measurement occurred at a time when production levels were between 500 000 and 1 500 000 bbl/d, corresponding to about half of all approved projects in the region. Shell noted that the WBEA Millennium station had shown a consistent trend of decreasing NO_2 emissions since 2007, and NO_2 concentrations measured at all WBEA stations were well below the *AAAQO* and *LARP* limits.

[264] Shell predicted that the annual *AAAQO* for sulphur dioxide (SO_2) would be exceeded in the RSA for the PDC. Shell maintained that the exceedance was related to population growth in Fort McMurray. Shell stated that for all other assessment scenarios, including at regional community receptors, SO_2 concentrations were below the *AAAQO* and *LARP* limits. Shell noted that regional sulphur emissions had been declining due to installation of flue-gas scrubbing at Suncor and Syncrude.

[265] Shell predicted that, in all three assessment scenarios, the 24-hour concentrations for $PM_{2.5}$ were above the *AAAQO* at the fence line, and in Fort McKay, Fort McMurray, Cabin J, Cabin K, and the Oil Sands Lodge. Shell noted that the exceedances were due to existing and approved projects in the region, but there was no increase in predicted concentrations as a result of the Project's emissions. Shell also noted that its assessment indicated that Fort McMurray's background $PM_{2.5}$ concentration would already be above the *AAAQO*. Shell maintained that the exceedance at its fence line was primarily due to mine fleet activities at adjacent operations and that there will likely be limited or no public access to the area.

[266] OSEC stated that Shell excluded developed areas from its regional assessment and that there was no basis for doing so. Shell noted that the *Alberta Air Quality Model Guideline* allowed the exclusion of developed areas in dispersion modelling. Shell stated that ambient air

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[6] *LARP* level 4 is the limit at which the ambient air quality exceeds the air quality limit

quality limits did not apply within disturbed areas because they are subject to *OHSA Guidelines* within the fence lines.

[267] Fort McKay stated that there was a need for better emissions controls to limit the impact that industrial developments have on regional air quality. Fort McKay noted that it would continue to rely on regulators to diligently manage and monitor air emissions to ensure that air emissions would not continue to rise at the current growth rate.

[268] OSEC stated that recent studies had found significantly elevated mercury levels in the snowpack near oil sands facilities, and fugitive emissions from mine fleets were the likely source of local deposition of mercury and other metals. Shell stated that the Project would have nearly negligible emissions of metals, as confirmed in Shell's current reporting trends in the National Pollutant Release Inventory (NPRI) database. OSEC stated that research has shown that considerably more particulate matter and trace metals were released from oil sands facilities than were reported to the NPRI, and the NPRI excludes mine fleet emissions from reporting requirements. Shell stated that studies have shown that 99 per cent of mercury emitted to the environment was retained by the watershed and did not contribute to changes in mercury concentrations in water. Shell noted, however, that its modelling assessment was highly conservative because it assumed that nearly all aerially deposited metals would reach the water bodies.

[269] OSEC noted that recently released abstracts from ongoing research studies showed findings of concentrations of PAHs and metals close to existing mine sites. Shell maintained that the recently released abstracts were preliminary results that had not yet been vetted by the scientific community. It noted that recently published research papers had confirmed that the deposition rate of PAHs in the PAD had not been increasing since the 1950s despite oil sands development and that most of PAH deposition was of natural origin.

[270] OSEC stated that Shell's EIA indicated that PAI levels already exceeded the *Acid Deposition Management Framework's* critical levels in 2 grid cells and 21 lakes in the base case. OSEC noted that Shell predicted exceedances of the PAI levels to increase to 23 lakes in the PDC.

[271] Shell maintained that its assessment indicated that 23 lakes would exceed critical loads in the PDC; however, a predicted exceedance of a critical load did not mean that a lake is suffering from adverse effects due to acid deposition but rather that monitoring should be done on the lake as a precaution.

[272] Shell stated that work done by the Cumulative Environmental Management Association (CEMA) indicated that the region was well below the *Acid Deposition Management Framework* criteria, and published documents by WBEA showed little change in NO_2 levels in the region since 1998. Shell stated that it would continue to provide a leadership role in regional initiatives that address the issue of acid deposition, including support for nitrogen deposition monitoring done by the WBEA's Terrestrial Environmental Effects Monitoring Program.

Analysis and Findings

[273] The Panel understands that Shell's model predictions indicate that PAI levels exceed the critical loads for a number of lakes as set by the *Acid Deposition Management Framework*. The

Panel notes that the PAI in the base case already exceeds the guidelines and although the Project will contribute to further increase these values in the application case and the PDC, they do not cause the guidelines to be exceeded. The Panel notes that Shell did not provide any specific mitigation strategies because it emphasized that the Project's acidification effects will be negligible. The Panel expects that the model predictions will show even further increases in PAI levels as more oil sands projects are proposed. The Panel finds that because the region is well below the *Acid Deposition Management Framework* criteria, there will be no significant adverse effects. The Panel recommends that the government of Alberta conduct regional monitoring to verify model predictions. The Panel believes that regional monitoring will provide the data to ensure that action can be taken to ensure that there are no negative effects from acid deposition.

[274] The Panel notes that Shell predicted exceedances of the *AAAQO* for $PM_{2.5}$ in the PDC due to existing and approved projects in the region and that it predicted no increases in concentrations as a result of the Project's emissions. The Panel also notes Shell's argument that Fort McMurray's background $PM_{2.5}$ concentration would already be above the *AAAQO*. The Panel is of the view that exceedances already exist in the baseline case due to conservative assumptions in the modelling and that the Project would not materially change the frequency of exceedances.

[275] The Panel notes that Shell's model predictions indicate that the *AAAQO* and *LARP* limit for SO_2 would be exceeded in the RSA for the PDC. The Panel believes that the Project would not be a major source of sulphur emissions.

[276] The Panel notes that Shell's modelling predictions indicate that the *LARP* limits for NO_2 will be exceeded in the RSA and LSA in the base case, application case, and PDC. The Panel acknowledges that recent regional modelling predictions have consistently shown exceedances of the *AAAQO* and *LARP* limit for NO_2; however, current monitoring trends have not shown exceedances of these limits.

[277] The Panel is of the view that many oil sands facilities have been approved but not yet built and that model predictions serve as a warning that the *AAAQO* and *LARP* limits may be exceeded when all approved oil sands facilities become operational. However, the Panel believes that the *LARP* air quality management framework provides an appropriate mechanism for managing NO_2 and SO_2 emissions to avoid exceedances of the *AAAQO* and *LARP* limits.

[278] The Panel also recognizes that *LARP* establishes that modelling should be used to understand the relative impact of future development plans on, and trends in, ambient concentrations. In this regard, the Panel believes that the predicted exceedances are likely due to conservative assumptions in the modelling and that actual exceedances are not likely to occur to the extent and frequency forecast. The Panel also notes that monitoring results and time will be available to allow for adaptive management adjustments if needed and that triggers and limits for NO2 and SO2 are designed to identify and prevent exceedances of critical thresholds before they occur.

[279] For the reasons expressed above, the Panel is of the view that the Project is not likely to result in significant adverse cumulative environmental effects on air quality provided that the mitigation measures and the Panel's recommendations are implemented.

GREENHOUSE GAS EMISSIONS

Project Effects

Evidence

[280] Shell stated that it would employ the following principles in managing greenhouse gas (GHG) emissions:

- be a leading company in carbon dioxide (CO_2) mitigation;
- address direct emissions from facilities;
- include the cost of CO_2 in the evaluation of all significant growth projects; and
- optimize and continuously improve energy efficiency in existing operations and in the design of new facilities

[281] Shell stated that the Project would have greenhouse gas emissions from direct emission sources generated on site, including emissions from the natural-gas fired cogeneration units, boilers, and mine fleet. The Project's indirect emissions would be generated in association with grid-sourced electricity consumption and would only occur when the cogeneration units are shut down.

[282] Shell noted that the Project would contribute approximately 1.2 million tonnes of GHG emissions in CO_2 equivalent per year (Mt CO_2e/yr). Shell stated that the Project's GHG intensity would be 32.3 kilograms (kg) CO_2 equivalent per barrel of bitumen produced (CO_2e/bbl).

[283] Shell maintained that governments must set policy to encourage greater energy efficiency and emission reductions across all economic sectors. Shell stated that the Project would comply with the requirements of Alberta's *Specified Gas Emitters Regulation* and any future federal regulatory requirements.

[284] Shell indicated that it would proceed with its Quality Urban Energy Systems of Tomorrow (QUEST) carbon capture and storage project. Shell noted that QUEST planned to capture more than one million tonnes of CO_2 per year beginning in 2015. Shell stated that QUEST was not a project-specific mitigation but would be used to offset emissions from all of its heavy oil and oil sands operations by apportioning benefits across its operations.

[285] OSEC stated that the Project's emissions at 1.2 megatonnes per year would increase Alberta's emissions by 2.5 per cent relative to 2010 emission levels. OSEC noted that Shell generated GHG emission estimates without considering the full lifecycle of emissions. OSEC also noted that the Project failed to offer any improvements in GHG emissions intensity over Phase 1.

[286] OSEC stated that Shell had failed to show how it would effectively mitigate the Project's GHG emissions, as most of the proposed mitigation practices were vague, business-as-usual, or not specifically tied to the Project.

[287] EC noted that Shell had provided general mitigation options but did not provide specifics, particularly how the proposed mitigation options would mitigate GHG emissions from the Project. EC concluded that it was unclear how Shell's mitigation options would fully mitigate the effects of GHG emissions from the Project.

[288] OSEC recommended that the Panel withhold approval for the Project until Shell provides a detailed plan demonstrating how Shell will mitigate the GHGs emitted by the Project and how Shell will reduce GHG emissions from the Project to a level less than that of a conventional oil and gas operation of similar size at start-up. OSEC also recommended that the Panel require Shell to have an operational carbon capture and storage system in place by 2020 to offset Project emissions.

Analysis and Findings

[289] The Panel recognizes that Shell has committed to investing in energy efficiency projects, alternative fuels, and lower carbon energy sources in order to manage GHG emissions.

[290] The Panel acknowledges Shell's intent to proceed with the QUEST carbon capture and storage project in Fort Saskatchewan, Alberta which Shell expects will capture more than one million tonnes of carbon dioxide per year beginning in 2015. The Panel further notes it is Shell's intention to apportion some of the benefits from this initiative to the Project. The Panel encourages Shell to offset more greenhouse gas emissions by implementing additional measures elsewhere.

[291] The Panel is of the view that the Project meets existing GHG regulatory requirements and is not likely to result in significant adverse environmental effects from GHG emissions, provided that the mitigation measures proposed are completed and implemented.

Cumulative Effects

Evidence

[292] Shell noted that the Project's GHG emissions of approximately 1.2 Mt CO_2e/yr would represent 0.5 per cent of Alberta's emissions and 0.2 per cent of Canada's emissions. Shell noted that GHG emissions and climate change were global issues and should be considered in that context. Shell stated that the Project's contribution to global GHG emissions at 0.004 per cent was insignificant.

[293] OSEC did not agree with Shell's view and noted that assessing the Project's impact on climate change on a global scale meant that the effects would virtually never be found to be significant.

[294] OSEC stated that Shell had not met its GHG reduction commitments established for MRM and JPM to reduce GHG emissions from the projects to a level less than that associated with imported oil. Greenpeace was of the view that Shell had made previous commitments to reduce GHG emissions from its oil sands projects but had since abandoned those commitments. Shell noted that it had an aspirational goal to reduce GHG emissions from its oil sands projects to the same level as the equivalent basket of imported crude into North America.

[295] OSEC noted that Alberta and Canada were failing to meet their climate change commitments. It said that immediate action was required to limit global impacts of climate change. OSEC stated that the Project would further contribute to the failure of Canada to meet its emissions reductions target of 17 per cent below 2005 levels by the year 2020. The Project would also contribute to the failure to meet Alberta's goal of reducing GHG emissions by 50 megatonnes by 2020. Greenpeace stated that Canada was not on track to meet its GHG reductions targets.

[296] EC noted that the Government of Canada was still committed to meeting its target of reducing GHG emissions by 17 per cent below 2005 levels by 2020. EC acknowledged that there was still work to be done by the federal government. EC indicated that it intends to draft regulations in 2013 to address GHG emissions, including those from the oil sands sector.

[297] OSEC stated that by 2020 the oil sands industry would represent approximately 14 and 36 per cent, respectively, of Canada's and Alberta's climate change emissions. OSEC said that the policy tools in place to achieve reduction in GHG emissions were not strong enough. OSEC pointed to the need for substantial reductions across all economic subsectors, including the oil sands. Greenpeace concluded that in the absence of effective federal policies and measures, no new long-lived sources of GHG should be approved.

Analysis and Findings

[298] The Panel believes that the Project's GHG emissions at 1.2 Mt CO_2e will increase GHG emissions from the oil sands industry and make it more difficult for Alberta and Canada to meet their GHG reduction targets. The Panel notes that Shell stated that it would comply with the requirements of Alberta's *Specified Gas Emitters Regulation*, which is the only existing regulatory requirement for GHG emissions. The Panel also notes that Shell committed to complying with any future Federal regulatory requirements. To this end, the Panel expects Shell to incorporate sufficient flexibility into the project design to facilitate retrofitting of any controls needed to fully comply with future climate change regulations.

[299] The Panel notes that Shell's goal is to reduce GHG emissions from its oil sands projects to the same level as the equivalent basket of imported crude into North America. The Panel believes that GHG emissions is an important concern for a number of stakeholders and expects Shell to follow through on its commitments.

[300] For the reasons expressed above, the Panel is of the view that the Project meets existing GHG regulatory requirements and is not likely to result in significant adverse cumulative environmental effects from GHG emissions provided that the mitigation measures proposed are completed and implemented.

CLIMATE CHANGE CONSIDERATIONS IN THE ENVIRONMENTAL ASSESSMENT

Evidence

[301] Shell considered climate change scenarios in its assessment of environmental effects using the Global Climate Model from 2001 (Intergovernmental Panel on Climate Change 3rd Assessment [IPCC3]). Shell noted that annual forecast changes in temperature relative to the

1961 to 1990 baseline for each of the 26 model and climate forecast scenario combinations range from 1.6 to 6.3 degrees Celsius. Shell noted that annual forecast changes in precipitation range from -5.4 to 18.4 per cent. Shell stated that this rise in average annual temperatures and a change in the upper and lower bounds of precipitation predicted by the climate change model may have an effect on aquatic resources due to increased winter flows and decreased annual mean and peak flows in surface water.

[302] In its assessment, Shell analyzed stream flow variables to determine linkages with trends in climate and predict potential resulting effects. Shell reported a decreasing trend in the Athabasca River flow records at various stations over the recorded time period for the river (1958 to 2006) and observed similar trends for the Bow River at Banff and Calgary stations over the same recorded period. However, the Bow River had a longer period of record available (1911 to 2006), and the resulting flow decreases during this period were less exaggerated compared with the shorter flow record series for the Athabasca River. Shell believed that the 40 to 50 year period of records for the Athabasca River may not properly reflect the long-term trend due to climate variability, climate change, or both. Shell cited a study that indicated that climate cycles can rotate in periods of 45 to 60 years. Shell noted that trend analyses of recorded periods less than 60 years should be completed with caution. As a result, Shell determined that an extrapolated flow model based on the Bow River would be more appropriate for analysing flow in the Athabasca River than the shorter flow model of recorded data for the Athabasca River.

[303] Shell presented evidence from the Journal of Hydrology[7] that states, "As shown from the Bow River discharge data, the estimated rates of trend become stable after the record length reaches 70–80 years. It should be clear that this is not simply a function of more data providing better statistical results, but it is the length of the data record relative to cycle length that is critical." From the same source Shell also quoted, "Given the predominance of climate cycles of 45–60 years observed from instrumental records, trend analyses of time series records of less than 60 years should be done with caution. The estimated trend from such analyses may have limited power in providing appropriate future trend estimates."

[304] Shell explained that 50 years of data was available for the Athabasca River and that it was necessary to use the longer period of data available from the Bow River to determine the more appropriate hydrogeological trend. As Shell indicated, its explanation is consistent with NRCan's article, *Assessing Climate Change Impacts on Water Availability for Oil Sands Development in the Athabasca River Basin*. In this article NRCan states, "The river [Athabasca River] discharge rates naturally fluctuate on decadal and century scale cycles, but since most records along the Athabasca River only date back 50 years, some cycles may be missed and therefore provide an inaccurate estimate of trends. Scientists have built models by integrating multiple observed cycles in river flow discharge." Shell also indicated that its decision to use a longer period of data is consistent with NRCan rationale that a trend extrapolated over part of a cycle makes the declining trend appear more severe than if the trend was extrapolated over the full cycle.

[305] Based on this methodology, Shell stated that the mean annual flows of the Athabasca River were predicted to decrease by about 7.8 per cent by the year 2050. However, using the shortened flow period for the Athabasca River, Shell stated that the resulting decrease in mean

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[7] Chen, Z., Grasby, S.E., 2009. Impact of decadal and century-scale oscillations on hydroclimate trend analyses. Journal of Hydrology 365, 122-133.

annual flow would be about 21.1 per cent. Shell determined that a longer flow period was more demonstrative of long-term trends and so even though the shorter flow model produced a larger reduction, it did not think it was representative. Shell stated that the decrease as predicted in the longer flow model in mean annual flows (a 7.8 per cent decrease) would not significantly change the Project or the predictions developed in the EIA. Shell considered these flow predictions to be conservative because model simulation and its analysis of regional and local data indicated an increasing trend. With respect to the seven-day low flow predictions, Shell determined that the seven-day low flow would not change appreciably using the longer-term flow model as opposed to the decreasing trend that is observed from the shorter period of record.

[306] Dr. Carver, on behalf of the ACFN, stated that Shell's methodology, data, and interpretations were incorrect and misleading. Furthermore, he stated that the conclusions were not supported by the material presented. Dr. Carver also stated that using the Bow River flow record to project the Athabasca River flow record was inappropriate because using the more recent period may be a more accurate representation of anthropogenic climate change. He noted that while Shell reasoned that past behaviour was a good predictor of future behaviour, this may not be the case with human-induced climate change.

[307] Dr. Carver said that to other methodological flaws include the use of subjective comparisons in discussions of modelling and non-conservative assumptions. He stated that a systematic chain of subjective considerations led Shell to conclude that critical minimum winter flow in the Athabasca River below Fort McMurray will not be affected by future climate change. He also said that Shell's conclusions were invalid due to the nested and systemic subjectivity and unscientific methodologies that Shell used.

[308] Dr. Carver stated that climate change introduces uncertainties into the EIA that, if not addressed appropriately, undermine the ability of Shell to deliver the outcomes projected in its EIA. Dr. Carver stated that an objective assessment of potential declines in future flow in the Athabasca River was key for evaluating total water withdrawals under *Lower Athabasca River Water Management Framework* restrictions for multiple projects in the oil sands region. He asserted that errors in this work could have far-reaching implications for mine viability in future decades. He explained that the low-flow periods of the river may be exacerbated by additional factors expected to drive these hydrograph metrics lower through time. These factors included that some experts expect climate change to result in deeper declines in the hydrograph as analyzed by the Phase 2 Framework Committee, that oil sands water withdrawals were increasing, and that the regulator's management framework permits substantial withdrawals. These combined pressures threaten the magnitude of Athabasca River flows and thus threaten water value and river function. He also noted that using a longer flow record may have significant ramifications in the EIA for the CEA of the Athabasca River and the PAD.

[309] EC noted that by not using the potential worst-case climate change scenario, Aboriginal concerns related to wetlands, river and stream flows, water quality, and the use of aquatic resources may also be not affected as Shell predicted. EC stated that without the consistent use of a representative set of seasonal precipitation and temperature assumptions, it was difficult to assess the potential long-term significance of aquatic effects that were driven by precipitation and temperature.

[310] ACFN noted that a more recently completed EIA in the oil sands region for the Teck Frontier project evaluated the effects of climate change using the updated climate model from 2007 (Intergovernmental Panel on Climate Change 4th assessment [IPCC4]). ACFN pointed out that the more recent model for Teck Frontier predicted the opposite effect on flows in the Athabasca River than Shell's model. ACFN questioned how Shell could state that the results of the EIA would remain unchanged if the newer model had been used.

[311] Shell responded that no single approach to this issue would satisfy all reviewers, and believed that the methods used appropriately characterized the impacts of climate change. Shell noted that the Teck Frontier EIA predicted that flows in the Athabasca River would increase significantly by 2050. Shell stated that because the EIA for the Project predicted a decline in flow, it should be considered sufficiently conservative.

[312] EC noted that Shell's climate change model and assumptions reduced the range and magnitude of predicted environmental effects while increasing the uncertainty of the effects predictions and the determination of their significance. It noted that Shell used inconsistent methodologies between tributary and main stem regions of the Athabasca River and also used a restricted range of climate model precipitation outputs based on annual values (-3.9 to +4.6 per cent) that likely underestimated potential climate change impacts in the region. EC stated that predicted biological effects may not be as stated in the EIA because Shell's sensitivity analysis indicated that a larger output, such as a 10 per cent change in precipitation, could trigger a significant change in stream flow. EC concluded, in particular, that concentrations of contaminants in the rivers could be higher than Shell predicted from its modelling and as a result, predictions on impacts to fish could be underestimated.

[313] Shell submitted that it had the ability to adaptively manage if climate change effects turned out to be different than it predicted through the *Phase 2 – Lower Athabasca River Water Management Framework* for the Athabasca River and had other means of water storage.

Analysis and Findings

[314] The Panel acknowledges that there is a high level of uncertainty associated with predicting the effects of climate change. The Panel finds that the climate change model used by Shell may not be the most conservative model; however, the Panel is satisfied with Shell's approach given that it was the best model available when Shell was preparing its EIA. The Panel notes that since that time, however, there have been improvements in climate change modelling that Shell should use when following up and monitoring to ensure that its predictions are accurate.

[315] The Panel agrees with NRCan's rationale that using full cycles of data provides better accuracy when estimating trends in flow rates. The Panel agrees with Shell's methodology for predicting trends in Athabasca River discharge rates. The Panel considers that Shell's methodology is consistent with the work completed by others to determine impacts of climate change on stream flows, and it is satisfied with this approach.

[316] Based on the above, the Panel believes that Shell's incorporation of climate change into its prediction of environmental effects of the Project was reasonable.

[317] It appears to the Panel that predictions of decreased flow would be more problematic for the environment than periods of increased flow, because a low flow that is lower than predicted could affect fish and fish habitat, human health through increased water contamination, navigation and use of land, and resources for traditional purposes. Therefore, the Panel believes that Shell's determination relating to the seven-day low flow is sufficiently conservative to predict significance of environmental effects.

[318] With respect to Shell's assessment of annual flow, the Panel understands that the decrease in flows predicted by climate change models is not a result of the Project; however, the Project and others in the oil sands region may act cumulatively with climate change to exacerbate the effects on the Athabasca River and other areas of the environment. If the predictions in the EIA based on climate change carry a degree of uncertainty and the predictions based on project effects are also uncertain, Shell's predictions of the Project's effects on the environment may be unreliable. The Panel accepts that adaptive management is an appropriate response for dealing with uncertainty and recommends that the Governments of Canada and Alberta ensure that Shell conducts rigorous follow-up and monitoring on environmental effects of the Project related to climate change predictions, and manages accordingly should those predictions be incorrect. Specifically, the Panel recommends that the Government of Canada ensure that Shell conducts this follow-up and monitoring in relation to *CEAA, 2012* section 5 effects. The Panel believes that managing environmental effects of climate change on the Project is important.

CHANGE TO THE PROJECT CAUSED BY THE ENVIRONMENT

Evidence

[319] Shell evaluated several environmental events that could have an effect on the Project. These events included climate change, forest fires, extreme weather, and seismic activities. For a discussion on climate change as it relates to environmental effects that may be compounded with project effects, see the Climate Change Considerations in the Environmental Assessment section. See the Greenhouse Gas Emissions section for a discussion on the Project's contribution to climate change.

[320] Shell stated that it designed the Project in such a way that it would be protected from extreme weather such as flooding, drought, forest fires and seismic activities. Shell proposed mitigation for floods, including locating facilities outside of flood risk limits, designing the closure landscape to provide flood plains to manage flood events, providing clean-water-handling facilities and sedimentation ponds, constructing perimeter dikes, and implementing erosion measures along pit walls and watercourse banks. Shell stated that it had designed the Project to handle less available water from the Athabasca River. Shell proposed mitigation for forest fires, including developing fire prevention and response strategies, identifying ignition sources, and conducting fire prevention training. Shell noted that the occurrence of seismic activity in the area is believed to be low, but that the design criteria account for the possibility of seismic activity over the lifetime of the Project.

[321] Shell used the Global Climate Model from 2001 (IPCC3) to evaluate the effects of climate change during the lifetime of the Project. Shell stated that even though a more recent model had been developed (IPCC4), it completed the EIA in 2007 when the output from that

model was not available. Shell stated that even though the newer model was refined to reflect current trends, the results of the EIA would not have changed if it had used IPCC4.

[322] Shell stated that a likely climate change scenario resulting from this model was a rise in average annual temperatures and a change in the upper and lower bounds of precipitation. Shell determined that it was unlikely that a change in climate, as described by the model, would have a significant impact on the Project. It stated that potential effects would be minor but may include an increase in winter temperatures, which could slow operations slightly, an increase in precipitation, which could affect mine stability, and a reduction in water availability, which could affect mine operation.

[323] Shell proposed better road construction and more drainage as mitigation measures. Shell also stated that it designed the Project to handle low water availability through the capture of groundwater and surface runoff for reuse in the extraction process. Shell also committed to comply with the *Water Management Framework for the Lower Athabasca River Phase 1* to further reduce withdrawals during low-flow conditions.

Analysis and Findings

[324] The Panel determined that Shell's assessment of the effects of floods, droughts, and forest fires on the Project is sufficient and that the design and mitigation measures proposed are reasonable to minimize potential effects. The Panel recommends that the Governments of Canada and Alberta ensure that Shell monitors environmental changes that result from climate change and undertakes adaptive management, as required, to respond to any unanticipated environmental effects that may affect the Project.

WATER WITHDRAWAL FROM THE ATHABASCA RIVER

Evidence

[325] Shell proposed four objectives for its Project water management plan:

- ensure sufficient water was available to meet Project requirements;
- minimize the Project's effects on aquatic resources;
- minimize consumption of fresh water; and
- maximize recycle and reuse of process affected water (PAW).

[326] The site water management strategies that Shell presented to achieve these objectives include:

- effective separation of clean water and PAW streams;
- recycling of PAW;
- a 30-day raw water storage to support operations during low-flow conditions; and
- capture of groundwater and site runoff for use in the extraction process to reduce river withdrawals.

[327] Shell indicated that the primary source of make-up water for the Project will be the Athabasca River. Supplemental process water will be supplied by runoff and seepage within the closed circuit system, the Basal McMurray Aquifer, and the PCA.

[328] Shell requested, under the *Water Act*, an allocation of 18 million cubic metres (Mm^3) of water per year from the Athabasca River for the Project, approximately 0.09 per cent of its average annual flow. Shell noted that the cumulative Lower Athabasca River water withdrawal for Phase 1 and the Project was 53.3 Mm^3 per year (Mm^3/yr) or approximately 0.27 per cent of the annual river flow. The Project would use the existing MRM intake structure. Shell also applied under the *Water Act* for approval to divert 24.5 Mm^3/yr of site runoff and 26 Mm^3/yr of groundwater.

[329] Shell stated that the reduction in mean seasonal Lower Athabasca River flows in reach 4 (from the Athabasca River gauge below Fort McMurray to the gauge at the mouth of the Steepbank River) for the application case compared to the preindustrial case (PIC) due to water withdrawals would range from 1.9 per cent in summer to 12.9 per cent in winter. Shell noted that the water reduction in the mean seasonal Lower Athabasca River flows for the application case compared with base case due to water withdrawals would range from 0.04 per cent in summer to 0.3 per cent in winter. Shell predicted that changes in water level at station S24 (downstream of Pierre River) would be less than 5 centimetres (cm) for the application case (less than 1 per cent of the maximum flow depth), with the Project accounting for 0.1 cm. Shell concluded that the predicted changes in the Lower Athabasca River flows and levels would have no perceptible effect on the river or the PAD.

[330] Shell committed to following the limits prescribed by the *Water Management Framework for the Lower Athabasca River Phase 1* to ensure that water withdrawals would be reduced as necessary during low-flow conditions. Shell committed to reducing water withdrawals across all of Shell's mineable oil sands projects to 0.2 m^3 per second (m^3/s) whenever the total flows in the river reach 87 m^3/s or less. Shell was confident that its adherence to the *Water Management Framework for the Lower Athabasca River Phase 1* would maintain the integrity of the Lower Athabasca River, including the PAD. Shell noted that the *Water Management Framework for the Lower Athabasca River Phase 1* would be adaptive and, as such, informed by ongoing scientific research and modified as necessary to protect the river. Shell committed to complying with Phase 2 and subsequent updates of the *Water Management Framework for the Lower Athabasca River.*

[331] DFO stated that it and ESRD were in the final stages of developing Phase 2 of the *Water Management Framework for the Lower Athabasca River* to address cumulative water withdrawals from the Lower Athabasca River. DFO noted that within the next few months, DFO and ESRD intended to consult with all First Nations that might be affected, Métis groups, companies that participated in the Phase 2 Framework Committee (P2FC)[8] report development, and other nongovernment organizations. DFO indicated that Phase 1 would remain in effect until Phase 2 is formally released. DFO stated that the Project would require water withdrawals from the Lower Athabasca River, which would affect flows in the river. DFO indicated that conditions of authorization issued under paragraph 35(2)(b) of the *Fisheries Act* for the Project will require

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[8] The Phase 2 Framework Committee (P2FC) was a multi-stakeholder committee established in 2008 to develop recommendations for a Phase 2 water management framework that will prescribe when, and how much, water can be withdrawn from the Lower Athabasca River for cumulative oil sands mining water use.

Shell to comply with the *Water Management Framework for the Lower Athabasca River Phase 1*.

[332] DFO acknowledged that the P2FC did not achieve consensus on a final set of water management rules due primarily to disagreement about issues associated with the EBF exemption specifications. DFO and Alberta took ACFN and other Aboriginal groups' reports into consideration when drafting the Phase 2 of the *Water Management Framework for the Lower Athabasca River*. DFO indicated that the Aboriginal base flow (ABF) figures presented were not indicative of the overall nature of the river's historic levels and that other factors (e.g., Bennett Dam, dredging) had affected Athabasca River navigation over time. DFO recommended that Shell continue its support for development of a monitoring program that focuses on CEA of water withdrawals.

[333] EC stated that the hydrograph of the Peace River has flattened due to the Bennett Dam. EC noted that the dam was constructed in the late 1960s, and in the mid-1970s there was a climatic or hydroclimatic shift towards drier conditions and lower snowpacks that has definitely contributed to some of the lower water levels in the PAD.

[334] MNA stated that when the Bennett Dam started operating, the flooding stopped in the PAD.

[335] ACFN stated that cumulative effects on the PAD were influenced primarily by historic changes in flow of the Peace River caused by the Bennett Dam. ACFN's position was that the Bennett Dam had changed water flows to the PAD, which forced members to change their patterns of traditional land use.

[336] DFO stated that it supported the EBF of 87 m^3/s and considered that the work done to propose this EBF and the discussions that took place were substantial. DFO mentioned that if flows in the Athabasca River were at or below 87 m^3/s, Phase 2 would still allow water withdrawals of up to 4.4 m^3/s, comprised of 2 m^3/s for Syncrude, 2 m^3/s for Suncor, 0.2 m^3/s for Shell Muskeg River, and 0.2 m^3/s for Canadian Natural Resources Limited (CNRL). DFO stated that 0.2 m^3/s to provide freeze protection of the facilities seemed reasonable.

[337] ACFN and OSEC expressed concerns that neither the *Water Management Framework for the Lower Athabasca River Phase 1* nor the P2FC recommendations for Phase 2 adequately considered the EBF.

[338] OSEC stated that Alberta and Canada have not met previous panel recommendations to implement a Phase 2 of the *Water Management Framework for the Lower Athabasca River* that includes an EBF beyond which further water withdrawals would be prohibited. In the absence of an EBF, OSEC recommended all water withdrawals be prohibited during periods of flows at or below 87 m^3/s to ensure that the Project does not contribute to damage to the river during low-flow periods.

[339] ACFN stated that nonconsensus P2FC report recommendations would be more protective of river flows than the *Water Management Framework for the Lower Athabasca River Phase 1* rules currently in place. Phase 2 of the *Water Management Framework for the Lower Athabasca River Phase 1* did not include the ABF. ACFN recommended that Alberta and Canada take the following steps immediately to prevent further harm:

- establish a temporary precautionary (cut-off) flow of 100 m^3/s until a science-based EBF can be determined. When the flow drops below 100 m^3/s, allow minimal withdrawals (a total of less than 1 m^3/s) to prevent freezing; and
- establish a temporary precautionary ABF at a level of 1600 m^3/s, and a temporary precautionary Aboriginal extreme flow (AEF) at a level of 400 m^3/s, during river travel months.

[340] Fort McKay noted that Alberta and Canada have not established an EBF for the Lower Athabasca River, and an increase in water withdrawals would cause the river to be at risk. Including the Project, the total water allocation from the Lower Athabasca River would be about 4 per cent of the river's mean annual flow. Fort McKay stated that there was no cut-off flow in the *Water Management Framework for the Lower Athabasca River Phase 1* and that the date when a complete cut-off flow may be implemented continues to be pushed further into the future.

[341] OSEC stated that the Oil Sands Developer Group agreed that operators could reallocate unused licence allocations within the group for the 2011–2012 winter. OSEC indicated that this could enable withdrawals greater than what would be permitted by the *Water Management Framework for the Lower Athabasca River Phase 1*. OSEC recommended conditioning any approvals to limit Shell's water withdrawal in the low-flow periods to 0.2 m^3/s for Phase 1 and the Project, and doing so without allowing Shell to purchase additional withdrawals from other operators. OSEC further recommended that Shell be required to retrofit its water diversion infrastructure so that withdrawals during low-flow periods could reach zero in the future.

[342] OSEC noted that the 30-day water storage proposed by Shell may not be sufficient to meet the Project's requirements during low-flow conditions in the Lower Athabasca River. OSEC stated that the proposed volume of stored water would not allow both Phase 1 and the Project to maintain regular operations, and would not be consistent with newer projects, such as the Total Joslyn mine, that have responsibly planned for 90 days of water storage and would be able to cease or limit withdrawals during low-flow periods.

[343] Shell stated that its current water management plan for the Project includes 30 days of river water storage onsite, although Shell would be able to draw from additional onsite water sources in the event of prolonged periods of low flow of the Athabasca River. Shell indicated that for the Project, it intends to reduce the amount of water withdrawal from the river by capturing onsite groundwater and surface water runoff, and through freeboard in its existing tailings facilities and ponds. Shell stated that potential options to minimize the footprint of raw water storage and the use of river water include treating process water onsite. Shell reaffirmed its commitment to comply with the phase 2 of the *Water Management Framework for the Lower Athabasca River Phase 1*, and stated that it would adapt to what this framework states about onsite water storage requirements.

[344] ACFN stated that the Project will affect regional hydrology. Water withdrawals would reduce Lower Athabasca River flows, which are already too low to support the exercise of treaty rights. ACFN claimed that Shell addressed only direct withdrawals but not indirect withdrawals through groundwater changes or tributary withdrawals. ACFN stated that these incremental water withdrawals would jeopardize the viability of the Lower Athabasca River downstream navigation.

[345] OSEC noted that to date, assessment reports have indicated that water monitoring in the Athabasca region was inadequate. OSEC indicated it would be inappropriate to draw conclusions about new projects or impacts based on RAMP data.

[346] Shell stated that for the surface water hydrology assessment it used data from RAMP, the Water Survey Division of EC and Alberta Sustainable Resource Development, the Water Rights Branch of Alberta Environment, and local monitoring stations installed in the LSA as part of the environmental setting studies. Shell stated it has supported monitoring of surface water quantity and quality under RAMP and would support the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*.

[347] EC stated that following the announcement of the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, Canada and Alberta have made good progress in implementing enhanced oil sands monitoring. EC noted that the two governments have also made progress toward putting in place the governance arrangements needed to jointly deliver this program and manage the transition to a government-run monitoring plan. EC added that the two governments would be managing the transition from current arrangements to a government-led plan. EC stated that scientific reviews have been critical of the RAMP's program design, implementation, and transparency of results. EC concluded that the two governments agreed that RAMP would be wound down in due course and its relevant activities delivered under the government-run monitoring plan. The *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* will monitor both surface water quantity and quality.

[348] Shell stated that its CEAs based on the current *Water Management Framework for the Lower Athabasca River Phase 1* indicated that the predicted changes in water level for the Lower Athabasca River through the application and PDC would be insignificant. Shell noted that if and when Phase 2 *of the Water Management Framework for the Lower Athabasca River* comes into effect, there would be further restrictions on water withdrawal from the Lower Athabasca River, reducing cumulative effects on hydrology.

[349] Shell stated in its 2010 navigability assessment that TC had identified the Muskeg and Athabasca Rivers as the only navigable watercourses in the Project area. Shell indicated that flow changes in the Lower Athabasca River would be affected mainly by the withdrawals for the Project rather than drainage area changes due to an increase in the closed-circuit area during mine development. Shell concluded that surface water withdrawals from the Athabasca River would result in negligible impacts on navigation. TC stated that the impacts of the Project on navigation in the Lower Athabasca River would be negligible.

[350] ACFN said that low flows would undermine the health of the PAD and its ability to sustain traditional resources, adversely affecting ACFN's ability to exercise its treaty and Aboriginal rights in the PAD. ACFN stated that Shell's CEA excluded the PAD. ACFN claimed that declines in Lower Athabasca River mean annual flow would be accelerated by additional industrial withdrawals that would lead to further declines in Lower Athabasca River flows. This would in turn lead to reductions in recharge of the PAD.

[351] Shell stated that it assessed project effects on the PAD in its May 2012 updated CEA for the application case and PDC. Shell concluded that cumulative effects of the Project in conjunction with existing, approved, and planned developments on water level changes and flooding in the PAD would be negligible. Since it predicted negligible surface water quantity

effects in the Lower Athabasca River, Shell concluded that the spatial extent of the aquatics RSA was appropriate.

[352] Shell stated that in the context of total river flows, the amount of water that Shell is proposing to withdraw is less than 0.1 per cent of the mean annual flow; and that the predicted change in the Athabasca River water level would be less than one millimetre, a change that would have no discernible effect on the Athabasca River or the PAD.

[353] Shell stated that cumulative effects on the PAD were influenced primarily by historic changes in Peace River flows caused by the Bennett Dam. Shell agreed with TC's observation that the Lower Athabasca River was historically dredged and that the river was now returning to its pre-1940s levels, likely explaining the increase in the occurrence of sandbars.

Analysis and Findings

[354] The Panel recognizes that Shell committed to:

- meet the conditions set out under the *Water Management Framework for the Lower Athabasca River Phase 1*, and under the updated Phase 2 when implemented;
- participate in oil sands mining water management agreements to ensure that industry meets the requirements of the *Water Management Framework for the Lower Athabasca River Phase 1* as amended;
- reduce water withdrawals to 0.2 m^3/s whenever the total flows in the river reach 87 m^3/s or less; and
- support cumulative effects initiatives from advisory bodies tasked with overseeing cumulative effects monitoring.

[355] The Panel acknowledges that DFO and ESRD are in the final stages of developing Phase 2 of the *Water Management Framework for the Lower Athabasca River*. The Panel understands that the federal and provincial governments will conduct a consultation process to determine acceptability of Phase 2 that will include all Aboriginal groups, industry, and other non-government organizations.

[356] The Panel agrees with the concept of a precautionary cut-off to protect the river and understands that Phase 2 is likely to include an EBF of 87 m^3/s that includes industry needs during low-flow conditions. The Panel agrees that the withdrawal limit of 0.2 m^3/s for the Shell MRM and JPM when flows are at 87 m^3/s should be maintained.

[357] The Panel recommends that the Governments of Canada and Alberta consider the precautionary cut-off flow approach to address impacts of water withdrawals during extreme low-flow conditions, and potential impacts on navigation. The Panel recommends that DFO, ESRD, the oil sands industry, and all other involved stakeholders, dedicate the necessary resources to ensure that Phase 2 of the *Water Management Framework for the Lower Athabasca River* is completed and implemented in a comprehensive manner by January 2016 as recommended in the P2FC report.

[358] The Panel believes that Shell's proposed 30-day onsite river water storage is appropriate considering that Shell has committed to complying with the *Water Management Framework for*

the Lower Athabasca River as amended, that Shell has additional onsite water sources to continue operating when low-flow restrictions on water withdrawal are in effect, and that Shell, if required to do so, would treat process water for re-use in its extraction process.

[359] The Panel believes that the data used by Shell was adequate based on what was available, including RAMP data. The Panel recognizes that RAMP will be wound down in due course and its monitoring activities will be assumed by an agency under government management. The Panel also recognizes that the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* proposes a more comprehensive monitoring program for both surface water quantity and quality that will address concerns over deficiencies in current monitoring activities. The Panel acknowledges that the Government of Alberta will establish a new arm's length environmental monitoring agency. While this takes place, the environmental monitoring of surface water quantity and quality in the oil sands region will continue to be led by the joint federal-provincial program.

[360] The Panel acknowledges observations from EC and DFO that flows and navigation in the PAD are also affected by Lower Athabasca River dredging cessation, the Bennett Dam, and changes in precipitation. The Panel recognizes TC's conclusion that the impacts of the Project on navigation in the Lower Athabasca River would be negligible. The Panel also agrees with Shell's prediction that there would be no impacts on navigation in the Muskeg and Athabasca Rivers or the PAD from project-related water withdrawals.

[361] The Panel concludes that with the implementation of Shell's proposed mitigation measures and commitments, the work being developed on the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* to address surface water quantity and quality, and adherence to the Panel's expectations and recommendations, it is unlikely that significant project and cumulative environmental effects on water flows and levels in the Athabasca River or the PAD would result from the Project's use of Lower Athabasca River water.

POTENTIAL EFFECTS ON GROUNDWATER FROM PROCESS-AFFECTED WATER

Evidence

[362] Shell stated that it will operate a closed-loop water handling system in order to prevent groundwater impacts from PAW during operations. It said that it will fully contain any water that has the potential to become affected by process-related operations (including seepage into mine pits) and will control it on site. Therefore, Shell concluded that there is very limited potential for PAW to impact groundwater resources during operations.

[363] Shell stated that it will construct the ETDA on the landscape without including a low-permeability lining on the bottom and that natural muskeg and clay till underlying the ETDA area will help to reduce downward flow rates. However, during operations, PAW seepage will occur as a result of precipitation flowing through the various materials deposited in the ETDA. Shell will mitigate this seepage by installing a system of perimeter seepage collection ditches, and managing the elevation of those ditches will allow Shell to control the hydraulic gradient and direct seepage into those collection ditches. Seepage collected in the ditches will be returned to the ETDA. Shell said that seepage may impact surficial deposits (including the PCA, which underlies portions of the ETDA) and potentially the Basal McMurray Aquifer, but that vertical

seepage below surficial deposits to the Basal McMurray Aquifer will be limited due to low-permeability oil sands material underneath the ETDA, which will preferentially direct seepage laterally.

[364] Shell stated that upon closure of the ETDA, it will cap it with low-permeability materials reducing the rate of water infiltration into, and therefore seepage out of, the ETDA, and will direct seepage toward backfilled mine pits and ultimately the EPL via the closure landscape. Shell did not anticipate lateral seepage and release to surface water bodies because mining will occur on three sides of the ETDA, and it will backfill those pits when mining ceases.

[365] Shell stated that it will backfill mine pits with a variety of materials, including tailings. There is potential for water infiltrating these materials to become degraded in quality and then be considered PAW. To mitigate and limit the seepage of this potentially impacted water into adjacent groundwater aquifers, Shell indicated that it will design the closure landscape in such a way that the water in the backfilled mine pits will migrate toward constructed wetlands and the EPL as groundwater discharge areas. Once potentially impacted groundwater enters the EPL, it will be subjected to the same mitigating processes as all water in the lake.

[366] Shell indicated that it will place low-permeability material adjacent to the PCA and other permeable sediments exposed in the pit walls prior to backfilling. This low-permeability material will restrict water from flowing from the backfilled mine pits into the PCA and other permeable sediments; instead, the water will preferentially flow toward constructed wetlands and the EPL, which will be the groundwater discharge areas.

[367] Shell stated that it completed conservative groundwater modelling to evaluate the potential for both backfill seepage and ETDA seepage and its possible extent. It also modelled the effectiveness of proposed mitigation options. Based on the available data on which the models were built, Shell considered that its proposed mitigation techniques would be effective at reducing potential seepage impacts to acceptable levels.

[368] NRCan was concerned that the groundwater model data inputs included limited site-specific data. Shell indicated that it will refine its conservative groundwater models as more data becomes available, which will validate and increase the confidence in the model outputs.

[369] Shell said that it will monitor actual groundwater conditions during operations, and *EPEA* approvals will require groundwater quality monitoring and reporting for potential impacts on groundwater from the backfilled pits and the ETDA.

[370] Shell committed to monitor for lateral seepage of PAW from the ETDA and stated that it will develop a closed-circuit seepage interception system to fully intercept seepage through the Quaternary deposits. Shell stated that it will install a system of wells to monitor and collect water that infiltrates the subsurface from the ETDA into the PCA. Shell stated that it has designed a conceptual groundwater monitoring program, and it intends to meet with regulators to develop a rigorous monitoring program if the Project is approved.

Analysis and Findings

[371] The Panel acknowledges that there is a risk of PAW reducing the quality of groundwater surrounding the proposed Project. Shell has presented several mitigation strategies that it said

will effectively mitigate seepage of PAW into the environment during operations and the post-closure period. The Panel agrees that the use of a properly designed and managed closed-loop water handling system will largely mitigate the risk of PAW-related groundwater impacts during mining operations. The Panel believes that the proposed ETDA seepage mitigation and management system will adequately address potential PAW impacts on surficial deposits from this structure.

[372] *EPEA* requires approvals for industrial facilities, including requirements for monitoring and reporting of groundwater conditions. Such requirements will exist for the ETDA, backfilled pits, and other operational areas of the Project. Shell must fully comply with all regulatory requirements in this regard and work with the regulators to develop robust monitoring systems and programs.

[373] Shell has completed groundwater modelling to understand the potential impairment to groundwater quality and the likely flow directions that groundwater would travel in the subsurface. The Panel finds that although Shell had limited site-specific data available to it for construction of its models, it made adequate use of available data and used appropriate professional judgment and scientific literature data in lieu of abundant site-specific data. Regular updating of the models with field data will allow for confirmation of the simulated results and verification of predictions of the current models. The Panel expects Shell to regularly update the groundwater models when field data is available and to inform the AER and stakeholders of any significant changes in model predictions resulting from incorporation of site-specific field data.

[374] The Panel recognizes that Shell is obligated to follow all requirements to report impairment of groundwater quantity or quality to the appropriate regulator. Shell should strongly consider developing a notification process to inform potentially affected stakeholders if such situations arise during operation or the post-closure period of the proposed project.

[375] The Panel requires Shell to place low-permeability material against all water-bearing permeable zones exposed in the pits (including the PCA) to effectively reduce the potential for PAW to be released out of the backfill into those permeable zones. Shell is expected to achieve a permeability equal to or lower than that of the low-permeability materials in the mine pit walls adjacent to the PCA and other exposed water-bearing zones.

[376] On the basis of the evidence, and subject to the condition prescribed above, the Panel does not believe that the Project will result in significant adverse effects to groundwater quality.

DIVERSION OF THE MUSKEG RIVER

Evidence

[377] In 2007, Shell proposed a mine plan that included diverting the upper reaches of the Muskeg River through a gravity pipeline to maximize bitumen recovery while minimizing environmental impacts. In 2011, after four years of consultation with First Nations groups, Shell developed an alternative plan, the MRDA Mine Plan, to address First Nations' concerns about the use of a pipeline to divert the river. The MRDA Mine Plan includes an open channel to divert about 21 km of the upper reaches of the Muskeg River across the northern portion of the

development area, allowing Shell to recover about 64 Mm^3 of resource. Shell stated that the diversion channel would sterilize about 4 Mm^3 of resource.

[378] Shell considered two other mining scenarios that would leave the Muskeg River intact. The first alternative contemplated mining on both sides of the river with a 200 m setback. This alternative would sterilize approximately 27.5 Mm^3 of recoverable bitumen at an average grade of 11.2 per cent bitumen by weight (wt %) and would involve two small satellite pits on the north side of the river. Shell indicated it did not assess the feasibility of this alternative as it would require multiple crossings of the Muskeg River and dikes or low permeability berms adjacent to the Muskeg River pillar, which is restricted by the availability of suitable material. The second alternative, which contemplated mining on only the south side of the river with a 200 m setback, would sterilize approximately 65.5 Mm^3 of recoverable bitumen at an average grade of 11.4 wt%.

[379] Shell stated that it anticipated that the proposed change to an open channel would allow navigation on the river through the construction and operation stages. Shell noted that there would be a very brief transition period when Muskeg River waters revert back from the temporary boundary channel to the newly established closure channel and pit lakes. Shell stated that the Muskeg River diversion would be subject to DFO and TC approval.

[380] ACFN stated that diverting the river would permanently affect water flows, water quality, and fishery resources. These impacts would in turn affect access to traditional lands, reducing the opportunities to use the resources in the area and significantly affecting spiritual values of the watershed. ACFN indicated that given the lack of analysis of TLU in Shell's revised MRDA Mine Plan, it was not assured that this reassessment would protect its treaty and Aboriginal rights and/or traditional uses.

[381] ACFN claimed that it was impossible for it to evaluate the impacts of the MRDA Mine Plan on the Muskeg River because Shell provided few quantitative details about the plan. ACFN considered that Shell's MRDA Mine Plan did not actually mitigate its concerns about disturbance of the Muskeg River. It stated that the river has cultural and spiritual significance to the ACFN, who have used the Muskeg River basin for millennia and continue to use the river and to access the lands within the basin. ACFN's preferred option would be to not divert the river. ACFN stated that it believed the ore beneath the Muskeg River and its riparian zone should be sterilized and that full protection of the river be put in place. ACFN stated that should the Project be approved, it strongly urged the Panel to approve it only on the condition that the Muskeg River be left in a natural state and not be diverted.

[382] Shell acknowledged that ACFN would prefer that Shell leave the river in place. However, Shell maintained that the alternative plan did attempt to substantively address the diversion concerns raised by several stakeholders. Shell claimed its evidence showed that the upper reaches of the Muskeg River that flow through the Project lease have low use by Aboriginal groups; therefore, Shell focused on protecting the lower reaches of the river that it considered more important for Aboriginal uses (e.g., fisheries). Shell noted that the MRDA Mine Plan still allows for continued access by watercraft along the river, and addresses some of the issues around losing the spirit of the river. Shell also pointed out that its closest Aboriginal neighbour, Fort McKay, had not objected to the proposal.

[383] OSEC stated that Shell's plan to mine the upper reaches of the Muskeg River and replace them with a diversion channel would adversely and permanently impact the river and its watershed. OSEC highlighted that the Project would remove about 21 km of the main stem of the Muskeg River and would disturb 40 per cent of the river's watershed. OSEC stated that the Project would cause unacceptable damage to the Muskeg River basin and that poor modelling and lack of credible monitoring data downplayed the major impacts on fish, fish habitat, and the Muskeg River.

[384] OSEC stated that it was concerned that, although the AER and past joint review panels asked ESRD to develop a management plan for the Muskeg River watershed, the *Muskeg River Interim Management Framework for Water Quantity and Quality* only deals with water quantity in the lower reaches of the river and specifies some water quality parameters.

[385] According to OSEC's assessment, the *Muskeg River Interim Management Framework for Water Quantity and Quality*

- does not include water quality parameters such as naphthenic acids and PAHs or any components for aquatic health;
- includes a water quantity objective to ensure no physical diversion or rerouting of the mainstem of the Muskeg River while the *Muskeg River Interim Management Framework for Water Quantity and Quality* is in place; and
- indicates that the decision on this application should be guided by the public interest, considering economic, social, and environmental values.

[386] OSEC also noted that in *Muskeg River Interim Management Framework for Water Quantity and Quality*, ESRD left with the AER the responsibility to determine whether mining the river is in the public interest.

[387] ACFN stated that the *Muskeg River Interim Management Framework for Water Quantity and Quality* included an objective that there be no diversion of the Muskeg River mainstem and was put in place in response to past joint review panel recommendations to manage cumulative environmental effects and protect the integrity of the river.

[388] Fort McKay stated that ESRD has not completed a comprehensive management plan for the Muskeg River but instead has set out arbitrary water quantity and quality parameters for it. According to Fort McKay, the *Muskeg River Interim Management Framework for Water Quantity and Quality* is incomplete and puts the Muskeg River at risk. In Fort McKay's opinion, if the area under and beside the river must be mined, the MRDA Mine Plan is an acceptable approach. Fort McKay stated that it did not object to the Project because it has an agreement with Shell about the site-specific impacts of the Project.

[389] OSEC noted that although Shell said that it can maintain the integrity of the lower reaches of the river, this is not the same as maintaining the ecological integrity of the watershed.

[390] Shell concluded that integrating operational and closure drainage plans would cause negligible changes in the mean annual flow levels in Jackpine Creek and to the water levels at Kearl Lake. Shell predicted that changes to the median, the mean open-water, and the mean ice-cover lake levels would be less than 0.3 m. Shell predicted that in the application case, compared

with the PIC, the mean annual discharge in the Muskeg River, at the mouth, would be reduced by 20.5 per cent during mine operations (2050) and would increase by 8.7 per cent at closure (2065 and far future).

[391] DFO noted that the Project would affect fish habitat from two upper reaches of the Muskeg River that would be diverted, lower reaches of Wapasu Creek, four unnamed water bodies, several unnamed tributaries of the Muskeg River, and Unnamed Water Body 4 in the McClelland Lake watershed. Lower reaches of the Muskeg River would also lose fish habitat as the result of flow alterations associated with the Muskeg River diversion and development of the mine.

[392] TC stated that impacts on navigation associated with the diversion of the Muskeg River could be mitigated through the terms and conditions of *NWPA* approval.

[393] ACFN stated that until Shell provided further details on the closure landscape, Shell could not conclude that the potential for the proposed reclamation works to affect downstream Muskeg River navigability is limited. ACFN stated that Shell did not adequately specify the rate of pit lake filling, the timeframe for when the EPL would feed the Muskeg River, and how long it would take for the open diversion channel to be closed and reclaimed. ACFN stated that Shell did not give enough detail on how it would direct the Muskeg River through the northern pit lakes before returning it to its original channel.

[394] Shell responded that it expected that the transition period during which navigation might be affected would be only days to weeks.

[395] Shell stated that it was confident that its proposed mitigation measures would maintain the integrity of the lower productive reaches of the river and that the proposed open-channel diversion would have either no change or positive impacts on water quality compared with the original diversion.

[396] Shell indicated that the diversion channel would only erode during the channel conditioning period with potentially high total suspended solid (TSS) concentrations in excess of regulatory guidelines. To minimize sediment generation in the channel, Shell proposed revegetation of the stream banks, overbank areas, and berms, and the use of channel armour where required.

[397] Shell committed to maintaining water quality in the Muskeg River in compliance with the *Muskeg River Interim Management Framework for Water Quantity and Quality* and the comprehensive framework once it is developed. Shell committed to working with regulators to finalize a comprehensive framework for the Muskeg River.

[398] Shell stated that it would monitor water quality in the Muskeg River and Kearl Lake regularly. If Project activities resulted in adverse effects on water quality, Shell would develop and implement an incident-specific response plan. Shell concluded that the Project would have a low-to-negligible effect on key water quality constituents in Jackpine Creek, Kearl Lake, and the Muskeg River.

Analysis and Findings

[399] The Panel notes that diversion of the Muskeg River has implications for resource sterilization, water quality, and use of the river, both during and after mining.

[400] The Panel acknowledges that Shell has committed to

- maintain water quality in the Muskeg River in compliance with the *Muskeg River Interim Management Framework for Water Quantity and Quality*,
- control diversion channel erosion and sediment generation and manage PAW in a closed-circuit system,
- monitor water quality in the Muskeg River and Kearl Lake and implement specific incident-response plans and mitigation measures when required, and
- work with regulators to finalize a comprehensive management framework for the Muskeg River watershed.

[401] The Panel acknowledges that Shell's hydrology CEA concluded that there would be negligible project-related effects on Muskeg and Athabasca River flows. The Panel finds that the MRDA Mine Plan provides adequate detail of Shell's intended approach to resource extraction under the Muskeg River and of potential project-related effects on navigation.

[402] The Panel recognizes TC's observation that Shell provided enough information to fulfill *NWPA* requirements. The Panel acknowledges TC's conclusion that the transition period between the end of temporary channel use and inception of the new navigational area in the Project's area would be short term and, according to TC's discussions with Shell, navigability would not be compromised. The Panel is of the view that Shell's proposed MRDA Mine Plan will allow for adequate navigation through the upper Muskeg River waterway.

[403] The Panel reviewed Shell's bitumen sterilization estimates for each alternative scenario related to maintaining the Muskeg River, using the set-back criteria proposed by Shell. For the alternative of mining on both sides of the river with a 200 m setback, the Panel estimates that about 23.05 Mm^3 of recoverable bitumen at an average grade of 11.0 (wt%) would be sterilized, or some 84 per cent of Shell's estimate. The Panel estimates for the alternative of mining on only the south side of the river with a 200 m setback, about 51.11 Mm^3 of recoverable bitumen at an average grade of 11.3 (wt%) would be sterilized, or some 78 per cent of Shell's estimate. Although the Panel believes that Shell has somewhat overstated the amount of bitumen resource that would be sterilized for each option, the volumes of resource that would be sterilized by either alternative is still very significant. The Panel believes that if either of these alternatives were pursued, significant feasibility and closure planning work would be required.

[404] The Panel recognizes there is an inconsistency between the plan to divert the Muskeg River and the *Muskeg River Interim Management Framework for Water Quantity and Quality's* goal of ensuring "no physical diversion or rerouting of the mainstem of the Muskeg River while the framework is in place" because it does not include the Project and therefore does not consider the contribution of the Project in the cumulative effects.

[405] The Panel recognizes that the relevant provincial agencies were not present at the hearing to address questions about the lack of Project inclusion in the *Muskeg River Interim Management Framework for Water Quantity and Quality*.

[406] The Panel finds that although Shell has provided an acceptable degree of information at the Project level, the current *Muskeg River Interim Management Framework for Water Quantity and Quality* does not fully address cumulative effects on the Muskeg River from oil sands projects. The Panel finds that the province has not applied the precautionary approach in considering the Project's impacts on the Muskeg River.

[407] The Panel has determined that diversion of the Muskeg River is in the public interest. The Panel notes that Shell predicted that the diversion will have low impact to water quality and water flows in the lower reaches of the Muskeg River. Furthermore, the upper reaches of the Muskeg River to be diverted have low fisheries habitat value, there is proposed compensation, and the evidence indicates there is limited Aboriginal use of the area affected by the diversion. The Panel finds that there will be significant and unacceptable sterilization of oil sands resources if the diversion does not occur.

[408] The Panel recognizes that ACFN has significant unresolved concerns about the proposed diversion of the Muskeg River, including the potential for impacts on its TLU activities, the exercise of Aboriginal rights, and on the spirit of the river.

[409] The Panel recommends that the Government of Alberta take immediate steps to ensure the comprehensive Muskeg River Water Management Plan is completed and approved to coincide with the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, which is expected to be implemented in 2015. This management plan should incorporate the Project.

USE OF END PIT LAKES

Evidence

[410] In 2007, Shell had proposed three EPLs containing MFT as part of its reclamation and closure plan for Phase 1 and the Project. In 2011, following consultation with Aboriginal groups and others, Shell proposed to use four EPLs free of MFT for closure management of Phase 1 and the Project. Shell stated that the elimination of MFT from the EPLs would result in better overall pit lake water quality. Shell indicated that the long-term flux of PAW from MFT would not be present in the EPLs, and that it would replace the void resulting from the removal of MFT with Athabasca River water.

[411] The proposed four lakes would have a total area of about 40 km^2. In addition to Athabasca River water, other sources of water to fill the EPLs include upstream inflows from Imperial's EPLs, reclaimed landscape runoff, tailings seepage and consolidation flux, and precipitation. Shell stated that by 2065, Shell and Imperial would have integrated closure drainage and that once Imperial's EPLs meet water quality criteria, it would release water into Shell's Northeast Pit Lake.

[412] According to Shell, the elimination of MFT from the EPLs would require two changes that could affect water quality: the creation and operation of DDA2 to remove PAW from fine

tailings, and the creation of deeper EPLs, which requires re-evaluation of meromictic and aeration potential. Shell stated that it would manage the PAW from the DDA within the closed-circuit system according to current mitigation measures and practices. Shell concluded that the impacts of construction and operation of the DDA on water quality would be negligible. Shell incorporated the changes to reflect the MFT-free EPLs and ran its pit lake model again. Shell's model predicted that the EPLs would be dimictic and that due to replenishment during the annual or semi-annual vertical mixing of the water column, dissolved oxygen (DO) concentrations would be above the aquatic life chronic guideline and would be sufficient for aerobic degradation of organic constituents.

[413] NRCan noted that Shell would capture all MFT as NST to form a dry deposit. NRCan estimated that the centrifugation of MFT would produce about 16 Mm^3 of saline and toxic PAW at the end of mine life. NRCan noted that Shell would not recycle the remaining PAW back to extraction; instead, Shell would place that final inventory of PAW in the EPLs. In NRCan's opinion, actively treating the water would be less risky to the environment than putting the water in the EPLs to let natural processes provide treatment.

[414] Shell indicated that because the ore body to be mined is shallower than other mineable areas, these lakes would be relatively shallower and larger in surface area than other EPLs in the oil sands region.

[415] In ACFN's opinion, littoral zones are too small in current pit lake designs. Shell stated that it was working to optimize the design of the littoral zone, having in mind ACFN's desire for more littoral zones in the EPLs.

[416] ACFN stated that Shell had not considered the cumulative effects of discharge from multiple EPLs into regional freshwater bodies. ACFN indicated that cumulative discharges from EPLs would have a significant adverse impact on surface water quality in the Athabasca River.

[417] Shell indicated that it used the aquatic life guideline values from the regulatory water quality guidelines (AENV 1999; CCME 1999, 2007; United States Environmental Protection Agency -U.S. EPA- 2002) for the impact assessment of the Project on surface water quality. Shell stated that it used various predicted mine-related water releases from other operators for modelling water quality in the Project area at closure and in the far future, including EPL waters from Imperial KOSP, Shell MRM, Syncrude Aurora North, and Shell JPM Phase 1.

[418] Shell predicted that concentrations of most contaminants in the EPLs would remain below aquatic life guideline values or within natural variation of the receiving streams at the time of initial discharge (2065) and in the far future (2165). Shell indicated that due to assimilation of PAW from the reclaimed landscape in the EPLs at closure, concentrations of barium, molybdenum, PAH group 6, sodium, strontium, sulphate, total dissolved solids (TDS), total nitrogen, and vanadium would exceed guidelines or levels of natural variation.

[419] Shell stated that, due to the removal of MFT from the EPLs, it would use additional Athabasca River water to fill the lakes. Shell noted that concentrations of aluminum, copper, iron, lead, manganese, and phosphorus in the Athabasca River are high, compared with regulatory water quality guidelines, which would cause EPL water to exceed these contaminants' guidelines in 2065. In contrast, the use of Athabasca River water would result in concentrations

of TDS, total metals, major ions, and organic contaminants in the EPLs to be within natural variation of water river quality at closure and in the far future (2165).

[420] Shell indicated that the chronic effects benchmarks (CEBs) used in the EIA are conservative thresholds by which potential effects of the Project on aquatic health can be assessed. Shell developed the CEBs for the Project in accordance with the 2007 CCME protocol. Shell concluded that the Project would have negligible effects on water quality in the Athabasca and Muskeg Rivers, and no significant effects on fish, fish health, or human health.

[421] Shell used CEBs to conduct its assessment of the application case and PDC cumulative effects on fish health. Shell noted that total metals and nutrients often exceeded aquatic life guideline values in its PIC. Shell said that parameters that it predicted would exceed guidelines under the base case snapshots would also do so in the PIC. Shell concluded that operating and approved developments in the oil sands region would not appreciably change the levels of acute and chronic toxicity, tainting potential, or labile naphthenic acids (biodegradable and more toxic) and refractory naphthenic acids (less toxic and nonbiodegradable) in the Athabasca River. It predicted that acute and chronic toxicity and tainting potential levels in the Muskeg River watershed would be appreciably lower than aquatic life guideline values, and labile naphthenic acids would be less than 1 milligram per litre (mg/l) under both the application case and the PDC.

[422] Shell indicated that the EPLs would be low in key contaminants such as those that cause chronic and acute toxicity and fish tainting. Shell predicted that labile naphthenic acids would be below 1 mg/l at closure and in the far future and, therefore, below CEB values or within the natural variability of existing local surface water bodies. Shell noted that the concentrations of refractory naphthenic acids in EPL water would be higher than corresponding CEB values for surface waters in the oil sands region. Shell noted that existing and proposed mitigation measures would ensure that acute and chronic toxicity and tainting potential would be at levels appreciably lower than the corresponding CEB values defined in the application. Shell committed to continuous water quality monitoring during operations and post-closure.

[423] Shell stated that its proposed EPLs would bioremediate contaminants in water and would help attenuate closure drainage flood flows. Shell indicated that even though its EPLs may not be similar to naturally occurring lakes, they would become self-sustaining aquatic ecosystems and would support fish and other aquatic organisms. Shell noted that there was no certainty about when the fish from the EPLs would be safe to eat. Shell stated that, based on the literature, fish would be safe to eat two to three decades after closure.

[424] OSEC asserted that naphthenic acids account for the largest contribution to the aquatic toxicity of the water in the EPLs and that they may bioaccumulate within the tissues of aquatic organisms and be passed up the food web. OSEC also noted that naphthenic acids may give fish an abnormal taste or smell.

[425] NSFMFM and the Clearwater Band stated that although Shell had committed to ensuring that EPLs would, with time, contain fish, it had not committed to ensuring that EPLs would contain the same species of fish currently found in the Project area, and could not say when the fish would be safe to eat. NSFMFM and the Clearwater Band expressed concerns about the time required for EPLs to provide adequate fish habitat, the quality of the fish in the EPLs, and the related health impacts should traditional land users consume fish from these EPLs.

[426] DFO stated that there was uncertainty about the likelihood of success of EPLs and that currently it does not consider EPLs to be a viable option for fish compensation. DFO noted that EPLs would provide some degree of fish habitat over time and that required fish compensation would be provided by Shell's Redclay Compensation Lake.

[427] Shell confirmed that it would not build its own demonstration EPL. Shell said that it had a high degree of confidence in its proposed EPLs based on ongoing research from Canadian Oil Sands Network for Research and Development (CONRAD) and CEMA, Syncrude's Base Mine Lake (BML) demonstration project, the predictions from the models it used in its EIA, and its proposed mitigation and contingency options. Shell committed to complying with current water quality guidelines, continuing to work with regulatory agencies toward better understanding of contaminant effects, and following CEMA's 2012 *End Pit Lake Guidance Document* (*EPLGD*).

[428] Syncrude and others have developed models that they intend to validate through Syncrude's BML demonstration lake. In Syncrude's opinion, it was important that current research and validation plans continue to completion; for this purpose, Syncrude would need a couple of decades of data to confirm the success of its demonstration lake. Syncrude stated that each EPL would be unique and must be successful, and even though the AER has approved EPLs in concept, it would be ESRD's responsibility to ultimately approve all forms of reclamation, including EPLs.

[429] Shell stated that it had designed, in compliance with current regulation, the closure landscape to drain toward wetlands and EPLs, and this would provide adequate passive water treatment and protect water quality in the receiving streams. Shell also stated that it would closely monitor the performance of the EPLs and would not release water into the environment until Shell and the public can be assured that water quality meets the applicable criteria.

[430] OSEC stated that while high salt levels could be diluted, they would remain in the receiving environment. OSEC stated that no water quality criteria have been developed yet for EPLs despite CEMA undertaking this work in 2003.

[431] Shell stated that ESRD has not developed criteria for EPL water release. When asked if it would commit to meet CCME and ESRD aquatic life guideline values when discharging water from the EPLs in the absence of discharge criteria, Shell responded that it was reticent to just agree to that because there are natural exceedances of CCME criteria currently occurring in the Muskeg River watershed. Shell indicated that it has to be cognizant of what the background water quality would be in the region into which Shell's EPLs would be discharging. Shell stated that in the absence of CEMA guidelines, it would agree to prepare a proposed set of criteria and request ESRD's consent to release on that basis, ensuring that the lower reaches of the Muskeg River will be protected.

[432] Shell indicated that it had not provided and was not prepared to provide an economic or technical feasibility assessment for actively treating EPL water in the event that the EPLs do not perform as expected because Shell believed the need for such treatment was not currently indicated. However, Shell said that if the EPL water did not meet criteria for surface water, it could draw on its existing experience to build water treatment into its mitigation plans and treat EPL water to make it acceptable. Shell stated that it had a high degree of confidence in the overall functioning of EPLs and that there was considerable time available to implement

adaptive management in accordance with CEMA's *EPLGD* if monitoring indicated that alternative water treatment was necessary.

[433] In Shell's opinion, adaptive management is not about having fully developed lists of alternatives at all times; it is about having a plan that can be delivered and a way of tracking and measuring progress towards the company's objectives. Shell indicated that one of the things that it is directly engaged with, and is very interested in the results of, is the work with Syncrude on its BML. Shell stated that monitoring and measurement plans would identify the trigger for when it might need to explore alternatives in more detail. Shell indicated that it would start filling the EPLs in 2050; this would give Shell 38 years to assess the BML progress and put in place alternative plans if the monitoring shows that there could be challenges with the remediation of the EPLs. Shell stated that its progress will be very closely tracked and monitored through its engagement with the regulators. Shell is confident in what it can deliver and is committed to doing what is necessary to make sure that at the end of the day, the mine will deliver the ultimate closure and reclamation landscape that is necessary.

[434] Shell stated that other types of mining industries have used water treatment facilities to either attenuate or eliminate the contaminants in the EPLs; it would have a significant cost, but technically it would be feasible. Shell noted that through the Mine Financial Security Program (MFSP), Alberta ensures that money would be available to do reclamation and that measures would be in place to guarantee that operators meet progressive reclamation commitments.

[435] OSEC stated that EPLs would have long-term and significant adverse effects, and that Shell had not demonstrated that EPLs would be technically or economically feasible. In OSEC's opinion, Shell's EPLs would not become self-sustaining ecosystems. OSEC indicated that Shell's plan to demonstrate the efficacy of its proposed EPLs would essentially rely on Syncrude's BML test results and CONRAD and CEMA research. OSEC concluded that current EPL modelling results are insufficient to approve the Project, and that the efficiency of EPLs to treat/dilute PAW remained unknown and untested. OSEC indicated that Shell had not conducted detailed assessments of alternative water treatment options that could be used in the event that the EPLs do not work as intended.

[436] OSEC noted that although Shell's modelling predicted that the EPLs' water quality would exceed Alberta's water quality guidelines and several CEBs at closure and in the far future, Shell concluded that the impacts on water quality would be negligible. OSEC also noted that Shell would rely on adaptive management, particularly as it related to EPL malfunctions, for which Shell had no contingency plans.

[437] OSEC disagrees with Shell's position that if there is a potential significant adverse effect, particularly as it relates to EPLs, the answer should be monitoring and adaptive management. In OSEC's opinion, adaptive management has proven to be a failure. To support its position, OSEC pointed out that

- CEMA's *EPLGD* stated that adaptive management has a poor track record worldwide and stressed the need for a concrete plan for the various failures that may occur;
- the Oil Sands Advisory Panel to the federal Minister of the Environment found that a clearly focused set of objectives and a statistically sound decision-making process that can allow for adaptive management in a rapidly changing oil sands environment does not exist; and

- Canada recommended contingency plans be developed because it was concerned about Shell's ability to predict and control effluent quality from the EPLs.

[438] EC stated that adaptive management allows for change over time, so if things are not working there are mechanisms for going back and making necessary adjustments in order to achieve the successful outcome. EC agreed with Shell's adaptive management approach to address any potential adverse effects that may be identified through monitoring and apply the appropriate mitigation.

[439] Shell stated that it has provided a comprehensive package of evidence on the potential effects of the Project, on the mitigation that it proposed, and on how it would implement that mitigation. The follow-up monitoring and the adaptive management programs that are planned by Shell are to demonstrate the accuracy of its predictions and, to the extent that the predictions are not accurate, to implement the adaptive management program.

[440] OSEC indicated that the Project will have significant adverse effects that cannot be mitigated and will not be in the public interest, and that the Panel should not rely on adaptive management as a solution for the Project's potential adverse effects. OSEC said that Shell must demonstrate that EPLs are viable by the date of its investment decision or provide a fully developed contingency plan before it can be granted approval.

[441] Dr. Schindler, on behalf of OSEC, asserted that Shell had not fully evaluated possible synergistic or additive effects of project contaminants. OSEC stated that targets for individual contaminants were meaningless in mixtures and that Shell relied on single contaminant guidelines for metals, which does not account for potential interactivity of effects from different contaminants. Dr. Schindler advocated the work of EC, Kelly et al, and Parrott et al to better assess compounding effects. Shell responded that where it knew the mechanisms of effect, it took these into account when it developed its CEBs. Where it did not know the mechanisms, Shell stated that it applied a reasonable level of conservatism. Shell indicated that current Canadian and American criteria for single chemical analysis are the current industry standards.

[442] ACFN asked that any approval or recommendation that the Project proceed be made conditional upon completion of an independent and scientifically rigorous assessment and verification of the accuracy of models used to predict the functioning of EPLs. It also said that such an assessment was required before the AER or a subsequent joint review panels issue any further decisions on oil sands projects in ACFN's traditional lands.

[443] Dr. Miller, on behalf of OSEC, stated that more than 25 EPLs will be created in the Athabasca River drainage, and each will contribute to the total loading of contaminants in the system. OSEC stated that each of these lakes might meet aquatic life guideline values but that Shell was inaccurate in making generalized statements about how overall compounding effects from each lake could affect the regional aquatic ecosystem. This was further complicated by a current lack of water quality guidelines for naphthenic acids and some PAH groups. OSEC noted that discharge of salts from one EPL might not create a serious impact on a river system but the cumulative impact could affect water quality far into the future. OSEC concluded that Shell did not fully examine EPL cumulative discharge.

[444] OSEC noted that Shell seemed to find that hard-rock pit lakes were comparable to oil sands pit lakes when they were successful but not comparable when they were problematic.

OSEC stated that neither it nor Shell has expertise in EPLs since there are currently no experts in this field because no oil sands EPL has been completed to date.

[445] Syncrude argued that it did not support CEMA's *EPLGD* because it would not provide guidance to regulators and operators in respect to the design and operation of EPLs. According to Syncrude, the fact that it has reservations about CEMA's *EPLGD* should not undermine confidence in EPL technology. Syncrude noted that it has made significant investments to continue operating for decades to come. This would accommodate progressive reclamation using EPLs and assure the financial capability to see that reclamation through to a successful conclusion. Syncrude added that the reality of valuable oil sands reserve back-stopping reclamation success is at the heart of the MFSP.

[446] Shell stated that its difference of opinion with Syncrude about the *EPLGD* would not affect Shell's ability to rely on BML to demonstrate the efficacy of Shell's end pit lake. Shell considered the work Syncrude is doing to be very informative to all of industry. Shell stated that it supports the *EPLGD* because it is trying to advance the science to help industry understand EPLs and provide successful EPLs in the closure environment. A recurring theme in the *EPLGD* was adaptive management, which Shell will apply to the Project in general and to pit lakes in particular.

Analysis and Findings

[447] The Panel recognizes that Shell's proposal to eliminate MFT from the Project's EPLs would improve current tailings management practices and could reduce fish tainting and potential toxicity in receiving water bodies.

[448] The Panel notes NRCan's concern that Shell would place the 16 Mm^3 final inventory of saline and toxic PAW in the EPLs. The Panel notes that the EPLs would also receive approximately 52 Mm^3 of tailings seepage and consolidation flux from 2050 to 2065, which the Panel believes is a very significant volume. The Panel recommends that ESRD include the following requirements for Shell to meet in any *EPEA* approval:

- provide contingency plans for EPL water that does not meet EPL release criteria, including active treatment options that Shell would implement to minimize impacts on receiving streams;
- validate the models used for predicting water quality in the EPLs and update mitigation plans accordingly as information on the PAW resulting from Shell's processes becomes available;
- provide a research schedule for the testing of EPL predictions and design features; and
- treat the entire volume of PAW that results from the drying of MFT at the end of mine life. This treated PAW shall meet release criteria prior to placing it in the EPLs.

[449] The Panel acknowledges that regulators have conceptually approved EPLs for several oil sands projects, subject to successful full-scale demonstration within 15 years after 2003, which is only 5 years from now. The Panel acknowledges that Shell's plan to demonstrate that EPLs would become functional, self-sustaining aquatic ecosystems depends on Syncrude's BML demonstration test, which will not be completed for about two more decades. The Panel

recognizes that mineable oil sands operators will not be able to meet the expectation to demonstrate the efficacy of EPLs by 2018 that was established by previous joint review panels.

[450] The Panel realizes that Shell plans to start filling the EPLs in 2050 and that Syncrude's BML test results would be disclosed in the early 2030s. The Panel understands that if the BML test results reveal significant issues with EPLs as reclamation options, Shell would still have almost 20 years to implement feasible alternatives to the proposed EPLs.

[451] The Panel requires Shell to provide to the AER annual reports that describe: Shell's EPL research and development efforts for the proceeding year; Shell's plans and timelines to demonstrate the efficacy of EPLs within the next twenty years; and alternatives to passively treating water in EPLs. The report must include all of Shell's efforts and contributions toward collaborating to demonstrate a full-scale EPL. The first such report must be provided two years before the expanded Jackpine Mine plant start-up.

[452] According to *CEAA, 2012*, the environmental assessment must take into account mitigation measures that are technically and economically feasible and that would mitigate significant adverse environmental effects of the designated project. The Panel notes that Shell declined to provide an assessment of alternatives for actively treating EPL water that would not meet release criteria if EPLs do not function as planned. The Panel requires Shell to provide, before beginning mining operations, a comprehensive economic assessment of feasible active water treatment options that Shell could implement to ensure that EPLs would meet water release criteria at closure.

[453] The Panel acknowledges that there is uncertainty about the ability to create, in a functional and timely manner, an EPL that would support fish fit for consumption. The Panel notes that Shell proposed that the NNLP compensate for the loss of fish and fish habitat and that EPLs are not included as part of the proposed compensation but that nonetheless, fish from the EPLs may be consumed by humans in the future. The Panel recommends that the Governments of Canada and Alberta include a requirement in any approval ensuring that Shell monitors fish tissue in the EPLs and, should the fish in an EPL exhibit elevated levels of contaminants, implement government-approved mitigation measures to prevent consumption of fish until they are safe to eat.

[454] The Panel understands that through the MFSP, Alberta will ensure that money will be available to complete reclamation. The Panel also understands that the MFSP liability calculation is based on approved reclamation and closure plans and includes activities such as treatment of contaminated soil and water, management of tailings and tailings structures, and development of lakes, watercourses, and wetlands, including filling water bodies. The Panel recommends that ESRD review the MFSP liability calculation and, if required, make corresponding adjustments to ensure that the total costs assigned to the treatment of contaminated soils and water are fully covered in the event that EPLs do not perform as predicted.

[455] The Panel acknowledges interveners' concerns about the lack of evidence demonstrating that EPLs are technically and economically feasible and about Shell's reliance on adaptive management to address potential EPL did not perform as expected. The Panel recognizes that the work that industry and others have completed through CEMA to update the *EPLGD* is a positive step toward improving the design of EPLs. The Panel considers that this guidance document contains reliable research about EPL design, but that until more information becomes available

(i.e., Syncrude BML test results), the Panel can only view the *EPLGD* as a guidance document and not as a regulatory tool. The Panel expects Shell to continue its participation in CEMA and other multistakeholder groups to research and refine assumptions about EPL development.

[456] The Panel acknowledges interested parties' concerns about adaptive management; however, the Panel agrees with EC's and Shell's views that monitoring and adaptive management are appropriate strategies for dealing with the uncertainties associated with EPLs. The Panel recommends that ESRD include in any *EPEA* approval a requirement for Shell to report on adverse effects identified through monitoring and the corresponding mitigation measures implemented by Shell in accordance with its adaptive management plans.

[457] The Panel acknowledges interested parties' concerns about Shell's prediction that EPL water quality would exceed thresholds in Alberta's water quality guidelines and several CEBs at closure and in the far future. The Panel also notes that Shell indicated that in the absence of EPL water-release criteria, Shell would prepare a set of criteria for ESRD to approve.

[458] The Panel recommends that ESRD consider the following when developing the EPL water release criteria:

- The criteria should be consistent with *LARP* water quality limits, which are based on provincial water quality guidelines.
- There are no provincial water quality guidelines for chemicals of concern such as, but not limited to, naphthenic acids and PAHs.
- The Governments of Alberta and Canada should work together to ensure that EPL discharge would have no significant environmental effects on fish and fish habitat.

[459] The Panel recommends that ESRD finalize and issue the EPL water release criteria in the early stages of the Syncrude BML demonstration test so that the criteria can be incorporated into the water quality objectives necessary to determine the success of EPLs.

[460] The Panel acknowledges that Shell complied with the requirements of *CEAA, 2012* by discussing environmental effects that are to be taken into account in relation to a change that may be caused to fish and fish habitat as defined in the *Fisheries Act*. The Panel recognizes Shell's assessment of project-related effects to aquatic health through analysis of potential for chronic or acute toxicity and increased stress on fish populations from release of contaminants. The Panel agrees with Shell's conclusion that there would be negligible project-related effects on the Muskeg River and the Athabasca River, including the PAD.

[461] The Panel is of the view that Shell's plan to manage surface water and PAW would assist to prevent potential effects on receiving water bodies. The Panel finds project-related effects from the EPLs will likely not result in a significant effect provided that Shell ensures that no EPL waters are released to surface waters before meeting prescribed surface water quality guidelines.

[462] The Panel agrees with the adaptive management concept and concludes that with the implementation of Shell's proposed mitigation measures and commitments and with the Panel's

requirements, expectations, and recommendations, it is unlikely that significant environmental effects would result from the use of MFT-free EPLs.

EFFECTS ON SURFACE WATER QUALITY

[463] Owing to the nature of the subject matter, the reader will see duplication between this section of the report and the Use of End Pit Lakes section.

Evidence

[464] Shell stated that the water quality of operating streams would be monitored regularly throughout operations to ensure compliance with corresponding regulatory requirements. Shell indicated that the Project's environmental controls for surface water quality during operations include

- separation of clean water and PAW streams: clean surface water from undeveloped areas would continue to flow to nearby streams, whereas PAW would be collected within a closed-circuit system and used in the process;
- collection of runoff from reclamation material stockpile (RMS), OBDAs, and off-site roads, and dewatering/drainage from muskeg and overburden in polishing ponds;
- conveyance of water from the depressurization wells to the ETDA; and
- collection of seepage and runoff from the ETDA through perimeter ditches and interception wells.

[465] Shell indicated that it used the aquatic life guideline values from the regulatory water quality guidelines (AENV 1999; CCME 1999, 2007; United States Environmental Protection Agency -U.S. EPA- 2002) and the *Water Quality Based Effluent Limits Procedures Manual* (AENV 1995) for the impact assessment of the Project on surface water quality.

[466] Shell indicated that the CEBs used in the EIA are conservative thresholds by which potential effects of the Project on aquatic health can be assessed. Shell developed the CEBs for the Project in accordance with the 2007 CCME protocol.

[467] Shell used CEBs to conduct its assessment of application case and PDC cumulative effects. Shell noted that total metals and nutrients often exceeded aquatic life guideline values in the PIC. Shell stated that operating and approved developments in the oil sands region would not appreciably change the levels of acute and chronic toxicity, tainting potential, or labile naphthenic acids (biodegradable and more toxic) and refractory naphthenic acids (less toxic and non-biodegradable) in the Athabasca River.

[468] Shell predicted that acute and chronic toxicity and tainting potential levels in the Muskeg River watershed would be appreciably lower than aquatic life guideline values, and that labile naphthenic acids would be less than 1 mg/l under both the application case and the PDC. Shell noted that existing and proposed mitigation measures would ensure that acute and chronic toxicity and tainting potential would be at levels appreciably lower than the corresponding CEB

values defined in the application. Shell committed to continuous water quality monitoring during operations and post-closure.

[469] Shell stated that concentrations of many other contaminants in the Athabasca River under base case conditions are higher than the corresponding aquatic life guideline values, mainly as a result of background watershed loading upstream of the oil sands region; contaminants with high concentrations include aluminum, arsenic, cadmium, chromium, copper, iron, lead, silver, zinc, total nitrogen, total phenolics, and total phosphorus. Shell indicated that high concentrations typically occur during spring and summer and that these contaminants typically also have high concentrations in the watercourses within the Project area under base-case conditions.

[470] Shell predicted that Project activities would have negligible effects on water quality in the Athabasca River and that contaminants such as labile naphthenic acids, acute and chronic toxicity, tainting potential, and TSS would increase only marginally in the Athabasca River under the application case. Shell also predicted that concentrations of boron and refractory naphthenic acids in the Athabasca River would increase downstream of the Muskeg River at the end of decommissioning and in the far future, with negligible effects on fish, wildlife, and human health.

[471] Shell predicted that all Athabasca River parameter concentrations would be within 10 per cent of baseline concentrations or below applicable aquatic life guideline values. It expected that changes in contaminant concentrations in fish tissues would remain below the CEBs. Shell concluded that activities associated with the Project for the application case and PDC would result in negligible effects on aquatic health in the Athabasca River.

[472] EC noted that water quality downstream of the proposed development would exceed some of the CEBs that Shell developed for the Project. EC recognized that CEBs represent sensitive responses determined in laboratory tests and that it would be difficult to extrapolate these results directly to the receiving environment. EC stated that the use of a restricted range of modelled precipitation underestimated the range in contaminant concentrations in the receiving streams and the predicted biological effects. EC noted that the CEB approach was based on assessing the response to a single chemical, creating uncertainty about the potential synergistic interactions between contaminants in the complex mixtures found in the environment.

[473] EC recommended that Shell recalibrate its aquatic models every five years with best available information and re-run simulations that estimate predicted impacts on the aquatic environment and make the results publically available.

[474] EC noted that previous panels assigned to assess oil sands projects recommended that specific water quality objectives be established for naphthenic acids. EC noted that these objectives were still not developed and predicted that they would not be available for about five years.

[475] Shell stated that under base-case conditions in the Muskeg River and Jackpine Creek, measured concentrations of the following contaminants are higher than the corresponding aquatic life guideline values: aluminum, barium, beryllium, boron, chromium, cobalt, copper, iron, molybdenum, PAH Groups 1, 3, 5, 6, and 7, silver, strontium, and vanadium. Shell stated that under the application case, the predicted peak concentrations of the above-mentioned

contaminants would be less than the corresponding CEBs and would result in negligible effects on aquatic health in the Muskeg River at closure and in the far future.

[476] Shell indicated that the effects of existing and approved projects on temperature, DO, and sediment quality would be negligible. Shell stated that polishing ponds in existing developments are an effective mitigation for the release of water from runoff, muskeg drainage, and overburden dewatering. Shell also stated that no effects have been observed on the DO levels and sediment quality of receiving surface waters; therefore, changes to these parameters are not significant for the base case.

[477] Shell indicated that muskeg and overburden drainage from the Project would not affect DO levels in receiving streams. Shell stated that data obtained from the operation of existing polishing ponds suggest that oxygen-consuming contaminants would be reduced to concentrations similar to the background levels observed in the Muskeg River. Shell noted that DO concentrations in polishing-pond waters are often higher than background levels for the small receiving streams, particularly during winter.

[478] Shell stated that the water that flows from muskeg drainage and overburden dewatering to polishing ponds would typically attain equilibrium and achieve temperatures similar to ambient receiving stream temperatures. Shell indicated that sporadically, the water temperature of some ponds might exceed receiving stream temperatures; however, the most extreme cases would increase receiving stream temperatures by less than 1°C with negligible effects on the receiving stream.

[479] Shell stated that temperature, DO, and sediment quality in the Athabasca River would not be affected by existing and approved developments. Shell stated that water temperature and DO in the Athabasca River would not be affected by the Project due to Shell's proposed mitigation and the relatively small volume of water releases compared with the river flow volumes.

[480] Shell predicted that changes in PAH and metal in the sediments of receiving watercourses and water bodies as a result of the Project would be negligible. The reclamation landscape and operational and closure drainage systems would be geotechnically stable with a low potential for erosion. Shell indicated that polishing ponds, wetlands, and pit lakes would trap eroded soils and particulate contaminants in surface waters, reducing concentration of PAHs and metals in receiving streams.

[481] Shell stated that it validated the surface water quality model used for the Project and that the results of the validation indicated that the water quality model overpredicted the concentrations of most of the contaminants when compared with observed data, and that predictions for a few contaminants concentrations were slightly lower than observed data. Despite these differences, predictions for most of the contaminants concentrations were consistent with the observed data. In the EIA, Shell stated it used the whole effluent toxicity[9] approach to measure the toxicity of external tailings facility (ETF) water seepage. Shell's results also indicated that concentrations of naphthenic acids, all total metals, and all dissolved metals were below the maximum values used to describe tailings pond seepage.

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[9] Water Quality Based Effluent Limits Procedures Manual, ESRD, 1995.

[482] OSEC stated that over a four-month winter period in 2008, 11 400 tonnes of airborne particulates, most of which were bitumen particles, were deposited within a 50 km radius of the main upgrading facilities. OSEC indicated that NPRI data showed that mercury emissions from upgraders in the area have increased several fold in the decade ending in 2010. OSEC noted that there is little mention of airborne sources in water and of some groups of PAH-related compounds, which are known to be increased in airborne emissions. OSEC also noted that PAHs are now known to travel at least 90 km from upgraders in the area and to have increased the background burden of lakes by from 2.5- to over 50-fold.

[483] Shell noted that OSEC had raised concerns about the level of mercury, PAHs, and other compounds in the Muskeg River watershed that result from air emissions and water emissions from oil sands development in the region. Shell stated that its evidence clearly showed that the Project's air emissions would not measurably change water quality in the region, and it reaffirmed that the Project would not have upgraders.

[484] Shell stated that due to the removal of MFT from the EPLs, it would use additional Athabasca River water to fill the lakes. Shell noted that concentrations of aluminum, copper, iron, lead, manganese, and phosphorus in the Athabasca River, already high compared with regulatory water quality guidelines, would cause EPL water to exceed these contaminants' guidelines in 2065. Shell also stated that in contrast, the use of Athabasca River water would result in concentrations of TDS, total metals, major ions, and organic contaminants in the EPLs being within the natural variation of water river quality at closure and in the far future.

[485] Shell stated that EPL water chemistry would be monitored during the filling period before release. If the monitoring data indicates that releases will be toxic or cause undesirable effects on receiving streams, the filling rate could be reduced to allow more time for toxic contaminants to biodegrade. Shell also stated that if required, passive treatment in the lakes might also be enhanced, or outflow directed to treatment wetlands for further treatment, to produce satisfactory water quality before release to receiving surface waters.

[486] Shell stated that releases from pit lakes would be from surface layers and, as a result, would have temperatures similar to the water bodies in the oil sands region, or would quickly attain equilibrium with background receiving stream temperatures. Shell indicated that in the event of detrimental changes to the thermal regimes of receiving streams, outflow from the pit lakes would be directed to ponds or wetlands with enough residence time to allow thermal equilibrium with the atmosphere to be obtained before release.

[487] Shell stated that it would implement a monitoring plan, in accordance with ESRD and DFO requirements, to measure the effects of the Project and to confirm that the proposed mitigation systems would be effective.

[488] Shell stated it is committed to maintaining water quality in the Muskeg River in compliance with the *Muskeg River Interim Management Framework for Water Quantity and Quality* and the comprehensive framework once it is developed. Shell would also comply with the cumulative water quality limits for the Athabasca River under *LARP*. Shell stated it would closely monitor the performance of these treatment facilities, and no water would be released into the environment until the water quality meets accepted standards.

[489] Shell stated it would continue to participate in multistakeholder organizations, such as RAMP and CEMA, to monitor water quality in receiving watercourses and water bodies and to confirm performance of mitigation. Shell indicated that it would work with regulators and stakeholders to develop a detailed aquatics monitoring program for the Project. Shell stated that the detailed aquatic effects monitoring program for the expansion would incorporate whole effluent testing and monitoring of aquatic health and would allow early-warning identification of cumulative effects followed by adaptive management actions as needed to mitigate these effects.

[490] OSEC noted that the RAMP and oil sands companies operate the existing network of flow and water level monitoring stations in the region. OSEC noted that to date, assessment reports have indicated that water monitoring in the Athabasca region was inadequate. OSEC indicated that due to RAMP's reported problems with the existing sampling programs, a general lack of understanding of baseline conditions, and inadequate analytical capabilities, it would be inappropriate to draw conclusions about new projects or impacts based on RAMP data.

[491] Shell indicated that with respect to the data used in the water modelling, Shell not only relied on RAMP data but also on data from ESRD, EC, and Golder Associates. Shell stated that most of the information collected was non-RAMP data. Shell noted it has supported monitoring under RAMP and would support the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*.

[492] Shell stated that changes to surface water and sediment quality in the PAD due to the Project in conjunction with existing, approved, and planned developments would be negligible; hence impacts on aquatic health in the PAD would also be negligible. Shell based its conclusion on literature reviews, data analysis from these reviewed studies, and EIA model results.

Analysis and Findings

[493] The Panel finds that for the assessment of project effects on aquatic health, Shell used current modelling programs, federal and provincial guidelines, and the latest CEBs. The Panel understands that Shell validated the surface water quality model and that the predictions were consistent with the observed data. The Panel agrees with EC's recommendation to recalibrate surface water quality models every five years with best available information and rerun simulations to validate predicted effects on the environment. The Panel understands that the whole effluent toxicity approach considers the combined effect of a mixture of substances in an effluent. The Panel agrees with the methodology used by Shell to assess the synergistic interactions between individual contaminants contained in the ETF process-affected water. The Panel recommends that ESRD include in any *EPEA* approval a requirement that Shell recalibrate surface water quality models every five years with best available information and re-run simulations to validate predicted effects on the environment and ensure compliance with regulatory water quality guidelines.

[494] The Panel believes that the data used by Shell was adequate based on what was available, including RAMP data. The Panel recognizes that RAMP will be wound down in due course and its relevant activities delivered under government management. The Panel also recognizes that the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* proposes a more comprehensive monitoring program that will address concerns about deficiencies in current monitoring activities. The Panel acknowledges that the Government of Alberta will establish a

new arm's-length environmental monitoring agency; while this takes place, the environmental monitoring in the oil sand region will continue through the joint federal-provincial program.

[495] The Panel acknowledges that the *Muskeg River Interim Management Framework for Water Quantity and Quality* does not include water quality targets and limits for naphthenic acids and PAHs, and that inclusion of these parameters is part of the recommendations that ESRD provided in the interim framework. ESRD also highlighted in the interim framework the need to develop a comprehensive management plan for the Muskeg River watershed in a timely manner. In the absence of the comprehensive management plan, the Panel recommends that ESRD update the *Muskeg River Interim Management Framework for Water Quantity and* Quality's current water-quality targets and limits to include naphthenic acids and PAHs to coincide with the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* expected to be fully implemented in 2015.

[496] The Panel concludes that with the implementation of Shell's proposed mitigation measures and commitments, federal and provincial government work on the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, and Panel's expectations and recommendations, significant project or cumulative environmental effects on surface water quality and aquatic health in the Muskeg River, Athabasca River, or PAD are not likely to result from the Project.

NO NET LOSS PLAN

Project Effects

Evidence

[497] Shell stated that landscape alterations and surface flow diversions associated with the Project will cause the loss of the following fish habitat areas and riparian areas in watercourse segments and water bodies:

- the upper Muskeg River mainstem
- lower reaches of Wapasu Creek
- unnamed tributaries and water bodies in the upper Muskrat River and Wapasu Creek
- unnamed water bodies in the upper Muskeg River watershed

[498] Shell stated that the habitat losses amount to 795 347 m^2 based on the surface areas of the affected water bodies and watercourse segments on existing digital maps.

[499] In accordance with *Fisheries Act* requirements, Shell developed a draft NNLP in 2012 that provided details of Shell's estimates of species-specific fish habitat losses and gains in the Project area and Shell's strategy to offset the losses. Shell noted that it identified several site options in its 2007 Conceptual Compensation Plan based on DFO policy. Shell used decision criteria to screen potential suitability of each compensation-site option, including

- potential for sterilization of mineable bitumen,

- conflict with adjacent developments,
- watershed size,
- fish access and colonization,
- previous stakeholder comments, and
- long-term sustainability.

[500] Shell stated that the compensation option it chose would be located off site and would entail development of South Redclay Lake in the Big Creek and Redclay Creek drainages, with associated outlet channels. Shell listed the following as some of the attributes of developing the South Redclay Lake option that made it Shell's preferred option:

- The site provides flexibility in sizing of the lake such that the lake can be developed to best match the compensation required.
- The site offers the potential for a phased development, which will provide opportunities to build the lake in stages as compensation is needed.
- The site allows potential integration with other compensation developments and to potentially expand the lake in the future if necessary.
- Development of the site would not require ore sterilization.
- The site is located close to much of the disturbance area and would support the same fish species as the affected habitat areas.
- The site is located on a Shell lease.
- The construction methods would result in the smallest disturbance footprint per unit area of lake created.

[501] Shell confirmed that, in the event the PRM does not proceed, its intention was to continue to advance its preferred compensation option with the understanding that the final size and scope of compensation works would depend on whether one or both projects are approved.

[502] Shell noted that the final decision on the appropriate location for fish compensation habitat would depend on a number of factors, including cost, regulatory approval, technical feasibility, constructability, and acceptability to stakeholders. However, Shell acknowledged that if any of these or other factors precluded development of fish habitat compensation at its chosen location, Shell would follow the appropriate regulatory process to choose an alternative location for approval.

[503] Shell noted that during the consultation process, First Nations suggested compensation construction in the PAD would be appropriate. Although Shell considered that option, it found that there was less certainty of actual benefits for fish compared to Shell's option. Shell stated that the reason it did not accept the PAD option was that it did not consider this option a "walk-away" solution and it would therefore involve regular maintenance in perpetuity.

[504] Shell stated that the South Redclay Lake compensation location would parallel the Athabasca River and would not impede wildlife movement along the river. Shell also concluded that it would reclaim areas used for compensation lake infrastructure, such as access roads, berms, stockpiles, laydown areas, borrow sites, and dams. Shell therefore predicted a negligible residual effect on wildlife populations in the region.

[505] ACFN noted that the Ronald Lake Herd of wood bison, the only nonprotected herd and thus is an important traditional resource located outside Wood Buffalo National Park, is near the proposed Redclay Compensation Lake. ACFN stated that it anticipated the compensation lake to inundate and destroy observed and known core Ronald Lake wood bison habitat, specifically a habitat type known locally as "buffalo prairie."

[506] Given that Shell showed that existing terrestrial habitat at the Redclay Compensation Lake location has a high biodiversity potential, EC requested that Shell provide a comparison of relative values for species at risk in species-at-risk habitat at the Redclay Compensation Lake location and at alternative compensation lake locations. EC stated that such information would provide direction on how to best avoid or lessen project effects on species at risk as required by the *Species at Risk Act* (*SARA*). Shell disagreed with EC's request and stated that because the Redclay Compensation Lake is a mitigation measure that is being proposed to meet the requirements of the *Fisheries Act*, issues surrounding species at risk should be taken up with DFO and EC, as it is DFO that will finalize the location of the compensation lake.

[507] Shell stated that taking into account mitigation and compensation measures there would be no project-related environmental effects on fish and fish habitat diversity.

[508] Some Aboriginal groups asked whether Shell had adequately taken into account early fish life cycle stages and species favoured by them when devising its mitigation and compensation plans.

[509] Shell noted that it had provided a detailed description of the various spawning areas identified and how Shell would be compensating for lost spawning and rearing areas in its NNLP. Shell added that the NNLP includes a description and qualitative rating of each habitat unit in relation to the habitat requirements of fish at their various life history stages (i.e., spawning, rearing, feeding, and overwintering). Shell noted that very few fish species inhabit the upper Muskeg River watershed and, according to DFO, the species present were less desirable from a management perspective. Shell added that these species were also very tolerant of fluctuations in water quality and flow. Shell also noted that the area is heavily affected by beaver activity, which changes Muskeg River flows, thereby affecting preferred grayling habitat.

[510] Dr. Schindler did not agree with Shell's conclusions about fish and fish habitat in the Muskeg River. Dr. Schindler stated that Shell has understated damage to fish in the Muskeg River. He indicated that there has been an 86 per cent decline in fish produced since predevelopment. He stated that a study by Bond and Machniak (1979) counted over 6000 fish, made up of 19 species. The study concluded that white sucker, longnose sucker, and arctic grayling used the river as spawning habitat, while other species used the lower reaches as a resting area or as a nursery. He also found Shell's suggestion that beaver activity on the Muskeg was affecting the grayling habitat to be absurd and stated that beaver and fish have coexisted in the Muskeg watershed for millennia. He also noted that many papers indicate that beavers increase fish habitat and wetland areas.

[511] Shell said that it had consulted with First Nations and had incorporated Aboriginal concerns into its NNLP. Shell emphasized that it used TLU information on fish species that would be affected by the Project to finalize NNLP fish distributions for compensation. Shell noted that the species Aboriginal groups identified as being of greatest importance for inclusion in compensation planning were walleye, northern pike, grayling, and lake whitefish.

[512] Dr. Carver, on behalf of ACFN, claimed that Shell's NNLP was descriptive, relied heavily on untested professional opinion, and lacked thresholds or tests to determine significance. OSEC contended that Shell pursued an approach to uncertainty whereby it compensated for scientific shortcomings by using unacceptably low fish habitat loss calculations. ACFN provided the following recommendations on how Shell could improve the NNLP:

- Support the completion of a traditional-use study to identify the expected balance in TLU opportunities with the NNLP and in the decades of mine operation before full NNLP implementation.
- Incorporate climate change projections into the hydrologic, geomorphic, and fish habitat modelling, and communicate the methods and results.
- Provide the selection criteria/weightings for the NNLP candidate compensation lake sites.
- Provide information about the inputs and outputs associated with the hydrologic modelling and all steps taken in calibration.
- Provide additional information for the surrogate streams and geomorphic assessments.
- Present uncertainty in compensation habitat estimates to regulators and explain the implications of aggregate uncertainty for the goals of the draft NNLP.
- Slow down the pace of mine development to allow the monitoring and adaptive management approach to function successfully.
- Choose monitoring contractors from an independent DFO-created eligibility list of approved monitoring contractors for the roll-out of the NNLP.

[513] DFO agreed in principle with Dr. Carver's recommendations to incorporate climate change projections into hydrology of the lake and fish habitat modelling, provide selection criteria weightings for NNLP candidate compensation lake sites, provide inputs and outputs for hydrologic modelling, and assess uncertainty of key NNLP components.

[514] DFO observed that Shell designed the NNLP to compensate for species of recreational, commercial, or Aboriginal use and that Shell did not intend the NNLP to directly replace habitat losses on a species-by-species basis. DFO noted that it requested that Shell provide at least a 2:1 ratio of habitat replacement and provide monitoring to assess whether changes to this ratio would be required over time. DFO stated that the species targeted were selected based on DFO's local and regional management goals, taking into account geographic and logistic constraints. DFO noted it intends to continue working with Shell on finalizing the draft NNLP.

[515] Shell stated that in terms of direct project effects on fish, the fish community within the direct Project footprint includes relatively few fish species, and the upper Muskeg River generally does not provide habitat for migratory species from the Athabasca River. Thus fish

compensation works would target specific species to increase fish diversity and trophic complexity. For example, it would target sport fish such as arctic grayling.

[516] In its NNLP, Shell stated that it based habitat modelling of South Redclay Lake on a mature lake, which South Redclay Compensation Lake may not be until 20 to 30 years after initial filling. Shell said that the compensation lake would be available to the public once its fish health testing indicated that Redclay Compensation Lake fish were safe to eat. For the purpose of calculating long-term habitat gains provided by the lake, Shell assumed that the physical habitat features (e.g., substrate conditions, shoreline vegetation, instream cover), primary production, and water quality characteristics (including short-term mercury increases) were developed to a stable and mature condition. Shell noted that it did not directly model the time lag until the lake matured and the interim conditions while the lake was developing, which is part of the reason for the 2:1 compensation ratio.

[517] Shell stated that it anticipated that the creation of the compensation lake would increase mercury concentrations in fish tissue in a pattern similar to other reservoirs created in Canada. Shell noted that mercury concentrations are generally highest in fish species that are top predators. In South Redclay Lake, these species would be northern pike and walleye.

[518] Shell committed to implementing mitigation measures outlined in its NNLP in order to reduce methyl mercury levels including:

- removing trees and large shrubs that would otherwise be submerged by the reservoir;
- informing stakeholders of the annual results of the mercury sampling and which species and sizes of fish do not meet the guidelines for human consumption;
- performing additional actions if mercury exceeds HC guidelines and background levels for any species, such as closing the reservoir to domestic fishing, posting warning signs on site and in the Alberta Fishing Guide for relevant species, notifying local stakeholders of the status of fish in the lake, and intensively fishing to remove and dispose of the fish that exceed the guidelines; and
- installing a temporary drop structure to prevent Athabasca River fish from entering the lake during the years when elevated mercury is predicted.

[519] Shell indicated that it had augmented the NNLP to account for ACFN concerns about methyl mercury generation in the compensation lake and the time required for full compensation of effects. ACFN voiced concern that the compensation lake would not produce harvestable fish for a number of years.

[520] OSEC questioned the effectiveness of mitigation measures for mercury and other compounds in Redclay Lake and also stated that, regardless of mitigation, mercury would be present in the lake for 20 to 30 years.

[521] DFO confirmed that it could take 20 to 30 years before mercury levels were reduced to concentrations that would make the fish safe to eat. DFO noted that Shell's proposal to remove vegetation as well as large-bodied fish could lead to a shorter period of elevated mercury levels.

[522] Shell stated that it is committed to monitoring for increased methyl mercury levels in the compensation lake. When asked about methods for ensuring that fish in the compensation lake do not enter an Aboriginal, recreational, or commercial fishery in periods in which there would be a high methyl mercury load, Shell responded that it has proposed an intensive fish harvesting program to remove the higher-trophic-level species from the lake.

[523] With respect to other mitigation measures that could be used to reduce methyl mercury, Shell noted that the reservoir bottom could be stripped or the reservoir could be capped but that these measures would significantly increase the footprint of the lake because of the need to have overburden storage areas. The increase in footprint would provide little additional benefit to limiting methyl mercury production.

[524] Shell stated that with effective implementation of planned mitigation measures as outlined in the NNLP, mercury accumulation in fish from the South Redclay Lake would pose a low residual human health risk. Shell noted that tissue mercury concentrations in walleye and Northern pike in the compensation lake could exceed the HC consumption guideline for commercial fish and that resource users may need to limit their consumption of these fish. Shell did not expect concentrations in whitefish tissue to exceed guidelines.

[525] ACFN claimed that the mitigation measures that Shell proposed were largely advisory based. ACFN stated that fish consumption advisories have been in effect for the Athabasca River since 2003 and that additional advisories would be of little benefit and would not address the problem of increased mercury contamination. ACFN further explained that even if mitigation measures allow fish to be harvested, Dene people might not feel that fishing in a compensation lake is a suitable alternative to fishing in traditional locations. ACFN stated its opposition to destruction of the natural fish habitat and the replacement of it with "unproven mitigation" in the form of a compensation lake. ACFN noted DFO's uncertainty about the potential for the success of Shell's proposed compensation works.

[526] Dr. Schindler, on behalf of OSEC, stated that the compensation lake may be subject to additional contamination through surface water runoff, snowmelt, spillages, and deposition from the atmosphere. Dr. Schindler claimed that fugitive sources were likely an important source of local deposition of mercury and PAH and stated that the Water Monitoring Data Review Committee reached a similar conclusion. EC concurred that mercury can be emitted from combustion sources, such as stacks, boilers, and fleet equipment, in particulate or gaseous form. OSEC noted that dust blown from mine sites was implicated in some of the toxic trace metals evaluated in the Kelly et al study and noted that stacks, in particular, can be an important source.

[527] OSEC said that the Kelly et al study concluded that considerably more particulate matter and trace metals are being released from oil sands facilities than are reported in the NPRI. The Kelly et al study also revealed that particulate deposition decreases exponentially with increasing distance from emission sources, but that deposition can still be found more than 50 km away from oil facilities. OSEC said that recent research by EC confirmed these findings.

[528] DFO confirmed that even though the Project does not have an upgrader, the compensation lake would be within 50 km of another project's upgrader. In addition, EC agreed that emissions from the mine fleet would fall close to the source. OSEC indicated that this could mean that the compensation lake could be subject to pollutants from the Project's stacks and mine fleet and from the upgraders of other projects in the area.

[529] Dr. Schindler noted that some mitigation measures being applied to fossil fuel burning and smelting sources throughout the U.S. should be applied to the Project. Shell responded that atmospheric mercury did not necessarily coincide with mercury in fish tissue because most of mercury in the environment does not contribute to changes in fish or water mercury concentrations. Shell also identified some studies showing trends of decreasing mercury concentrations in fish tissue in the region. Dr. Schindler disagreed with Shell's conclusion, stating that the Harris et al study indicated an increase in mercury in fish as a result of added mercury in the environment. Dr. Schindler recommended that oil sands activities that add mercury to the environment not be allowed. Dr. Schindler also recommended that measures be taken to reduce emissions of toxic elements and compounds from upgraders, and that measures be required to prevent the transport of emissions to streams from mined areas and infrastructure.

[530] Shell stated that compensation would be in a phased manner in accordance with the timing of habitat disturbances. Shell stated it assumed that compensation would be provided at a ratio of 2:1 and that timing would be based on the start of the impact on fish and fish habitat. Shell noted that it might provide compensation earlier than required, and therefore may not need to provide a 2:1 compensation ratio, but it did not provide timing details. Shell noted that it would construct permanent inlet and outlet channels at closure once the full scale of lake development for the Redclay Creek area was known and integrated. However, based on the mean annual discharge from Redclay Creek and Big Creek, Shell expected lake filling would be complete within the first two to four years after construction.

[531] Shell believed that future EPLs can be designed to perform as well as the existing Phase 1 compensation lake and that water quality concerns about drainage from the closure landscape can be managed. Shell noted that the NNLP does not consider any credits for fish habitat created within the future pit lakes or closure landscape that could provide for ratios much greater than 2:1. Shell recommended that regulators consider the use of MFT-free pit lakes and other closure fish habitat as eligible compensation and provide proponents with appropriate guidelines to use to achieve fish habitat compensation objectives.

[532] Shell stated its understanding that a greater-than-1:1 compensation is provided to account for such factors as the time delay between when habitat is disturbed and when fully functioning habitat is provided. Shell disagreed that a 2:1 ratio should be the minimum compensation requirement. Shell stated this 2:1 requirement does not consider potential for early compensation. Shell proposed that DFO scale the compensation ratio to timing of delivery of functioning compensation habitat.

[533] OSEC asked DFO what options would be available if the compensation lake does not work. DFO responded that it believed that the mercury would be manageable. It also stated that the amount of time it expected mercury to be elevated was within a range of time in which it would expect that ongoing work and study could determine the actual productivity of the lake before fish from the lake are available for human use. DFO indicated that if the compensation lake was not agreed upon during consultation, it could look at other options to compensate.

[534] OSEC also asked whether the lake would be considered to be habitat compensation during the period of time that mercury levels in it were elevated. DFO responded that if fish have to be isolated to ensure that they are maintained, that would not count as compensation time, which is why compensation ratios are generally greater than 1:1.

Analysis and Findings

[535] The Panel acknowledges that Shell provided a description of its project-related fish habitat losses and gains in its EIA and draft NNLP as required by *CEAA, 2012* and the *Fisheries Act*.

[536] The Panel notes that proposed compensation for project-related effects will occur off-site (Redclay Compensation Lake and associated works) in accordance with DFO's hierarchy of habitat preference under *The Department of Fisheries and Oceans Policy for the Management of Fish Habitat*.

[537] The Panel finds that Shell provided only superficial rationale for its choice of compensation lake site options in its NNLP. The Panel finds that Shell did not provide the criteria it used, what specific parameters it considered, or any weighting of these parameters in its decision making process. The Panel also finds that Shell did not specify how it incorporated traditional knowledge into its evaluation.

[538] The Panel notes that Shell provided a general description of factors used to inform its fish habitat compensation site decision. The Panel acknowledges Shell's statement that Shell took into account effects on terrestrial resources in conducting its compensation site assessment. However, the Panel finds that Shell's compensation site selection study provided no methodology or criteria specific to how potential terrestrial species effects were incorporated into its decision making.

[539] The Panel accepts Shell's determination that there are no bison in the LSA. However, the Panel notes that the LSA did not include the NNLP compensation habitat on the west side of the Athabasca River. The Panel believes that bison may use habitat on the west side of the river where the compensation lake is proposed. The Panel finds that a level of uncertainty about the potential environmental effects on wood bison remains, and in the absence of a *SARA* recovery strategy, it is difficult to determine the significance of the effect.

[540] The Panel recognizes that the NNLP provides extensive detail on how Shell calculated individual fish habitat requirements, the habitat areas lost, and the proposed habitat areas gained through compensation. The Panel acknowledges that the NNLP methodology Shell applied is typical of other compensation program approaches used regionally and nationally and that it is acceptable to DFO.

[541] The Panel also notes that DFO will require Shell to provide a degree of compensatory habitat (2:1) through the NNLP commensurate with predicted current and future losses. The Panel understands that the amount and type of compensation is to be monitored and adjusted through adaptive management if required. The Panel also notes that the chosen compensation does not replace the same habitat or species lost in the Muskeg River, but that it was targeting desirable species, such as arctic grayling, and their habitats.

[542] The Panel notes that Shell's NNLP did not provide quantifiable benchmarks or thresholds for assessing significant effects on individual species or on population diversity and abundance. The Panel further notes that Shell did not provide any quantifiable adaptive management benchmarks or triggers.

[543] The Panel acknowledges that the proposed 2:1 compensation ratio for fish habitat takes into account delays in the compensation works becoming fully operational and available for public use. The Panel understands that an extended period (more than 20 years) will elapse before fish are available for human consumption.

[544] The Panel recognizes that elevated surface water methyl mercury levels may lead to bioaccumulation of mercury in fish and that these fish could be consumed by local residents. The Panel acknowledges that Shell has proposed some mitigation measures to address mercury input into the compensation lake and has proposed measures to prevent fish consumption when methyl mercury in the lake is high. The Panel agrees that preventing human consumption of fish that have unhealthy level of mercury is critical.

[545] The Panel understands that PAHs and mercury are ubiquitous in the environment and that forest fires and anthropogenic disturbances are important contributing factors. However, the Panel recognizes that a significant amount of the PAHs found in the environment may be due to inefficient combustion and fugitive emissions from oil sands operations. Based on recent studies (Schindler, Kelly, and Kirk), the Panel is of the opinion that Shell's proposed compensation lake may also receive atmospheric emissions from existing facilities and upgraders. It is unclear to the Panel whether Shell's modelling accounted for aerial deposition of PAH and for mercury concentrations. The Panel finds these emissions to be important contributors to the overall contaminant load in the compensation lake. The Panel recommends that the Government of Canada ensure that Shell updates its models to account for sources of aerial deposition of mercury and PAH. Shell should provide the results to the Government of Canada and determine appropriate mitigation measures in consultation with the appropriate government departments, stakeholders, and Aboriginal groups if the predictions are different than what was presented to the Panel.

[546] The Panel is of the view that Shell's predictions about methyl mercury levels in the compensation lake carry some degree of uncertainty. The Panel further notes that information gaps regarding human health effects of exposure to PAH concentrations still exist.

[547] The Panel recommends that the Government of Canada require Shell to implement a monitoring plan to determine the level of mercury and other contaminants in the post-construction compensation lake and to identify any resulting contaminant increases in fish tissue. In the event that fish tissue contaminants exceed HC recommendations, the Panel recommends that DFO require Shell to implement the adaptive management program as outlined in its NNLP.

[548] The Panel recommends that the Government of Canada ensure Shell develops a specific timeline, including milestones, for when fishery resources provided through compensation works would be publicly available. The proposed timeline should be incorporated into any *Fisheries Act* s. 35 authorization.

[549] The Panel notes Aboriginal concerns over the possible inability of Shell's compensation strategy to provide immediate compensation for lost project-related fishery resources. The Panel finds that Shell provided limited contingency options for the event that the proposed compensation works do not meet the prescribed 2:1 ratio.

[550] The Panel finds that uncertainty remains as to when Shell's proposed compensation plan can actually provide publicly usable fishery resources. The Panel also finds that Shell has not fully considered options in the event it cannot meet its *Fisheries Act* compensation requirements.

[551] The Panel recommends that DFO require Shell to address the following matters in its final NNLP, and that DFO ensure that these matters are addressed, to its satisfaction, before issuing any *Fisheries Act* section 35 authorization:

- consider the effects of climate change in fish habitat loss/gain calculations
- provide methodology selection criteria weightings for NNLP candidate compensation lake sites
- provide inputs and outputs for hydrologic modelling
- assess uncertainty of key components of the NNLP

[552] The Panel recommends that the Government of Canada provide specific benchmarks or thresholds for assessing significant effects on individual target fish species and on population diversity and abundance. The Panel also recommends that the Government of Canada ensure that Shell incorporates these benchmarks or thresholds into its proposed adaptive management strategy.

[553] The Panel is of the view that there will be no significant adverse effect on fish and fish habitat if Shell proceeds with its proposed compensation works and if the Panel's recommendations are followed.

Cumulative Effects

Evidence

[554] Shell stated that it considered potential effects on fish habitat and abundance that could not be mitigated to be residual effects. Taking into account mitigation and compensation, Shell concluded that there will be no residual project-related impacts on the Muskeg or Athabasca Rivers. Shell concluded that if magnitude of effect was negligible, it did not rate geographic extent, duration, reversibility, and frequency. Shell therefore concluded that there would be negligible effects on fish habitat, fish abundance, and diversity in both its application case and PDC.

[555] Dr. Schindler, on behalf of OSEC, stated that it was unrealistic to assume no permanent biological damage to the Muskeg River, including its resident fish species, from the 10 mines in operation and development in the region. OSEC stated that it would be difficult to assess whether the No Net Loss policy goals would be met because Shell assessed components of the impacts as discrete components but did no integrated assessment.

[556] DFO remained concerned that Shell had not assessed the potential cumulative effects of oil sands development on Athabasca River Delta fish and fish habitat and that potential cumulative effects downstream in the Muskeg River and Lower Athabasca River watersheds remain uncertain. DFO recommended that the Panel recommend that Shell conduct a CEA on downstream fish habitats, including middle reaches of the Muskeg River, JPM, and KOSP fish habitat offsets, Kearl Lake, the lower reaches of the Muskeg River, and the Athabasca River,

including the Athabasca River Delta. DFO stated that although it was possible for an individual operator to undertake this assessment, an alternative would be to conduct this assessment in cooperation with other oil sands operators and regional stakeholders.

[557] Shell disagreed with DFO's recommendation that additional assessment of downstream fish habitats was required. Shell stated that it had provided CEA as part of the Project's EIA for features in the Muskeg River watershed and for reaches of the Athabasca River below the confluence with the Muskeg River. Shell concluded that its current CEA provided the necessary information to inform a public interest determination. Shell also stated that it continues to be committed to participating in and providing data toward regional initiatives as requested.

[558] DFO also recommended that Shell be requested to develop, in collaboration with Aboriginal groups, industry, and government, initiatives to detect, monitor, and adaptively manage cumulative effects on fish habitat in the Lower Athabasca River watershed, and if effects are detected to mitigate or offset those effects.

[559] ACFN claimed that No Net Loss planning does not have a good overall track record and quoted the Cohen Commission Final Report that stated that over half of the projects the Commission reviewed had smaller compensation areas than harmful alteration, disruption, and destruction (HADD) areas; over one-third clearly did not achieve No Net Loss; and at the operational level, all indications are that Canada is not meeting its No Net Loss obligations.

[560] In response to an ACFN question about what methodology DFO uses to assess cumulative impacts, DFO responded that, on a case-by-case basis, it strives to offset the residual effects of each project and thus prevent the occurrence of cumulative effects on fish habitat. DFO stated that because there is uncertainty about how the compensation lakes will function and how they will contribute to the natural ecosystem, associated cumulative effects are also uncertain.

[561] In response to an ACFN question about whether DFO had developed any methodology for assessing cumulative impacts in the region, DFO noted that any methodology applied would most likely be related to population-level assessments. DFO explained that there are existing methods for assessing fish population characteristics in the region for different species, and if a change in populations is detected, a cumulative effect could also be determined. DFO confirmed that it had not considered any other contingency options in the event that Shell's proposed compensation plan cannot fully compensate for lost fish habitat through adaptive management.

[562] In its NNLP, Shell stated that environmental consequence ratings for wildlife impacts from the Project varied from negligible to low and that these ratings would not change as a result of the construction of South Redclay Compensation Lake. Shell noted South Redclay Lake would flood a long narrow paleochannel characterized by wetlands and beaver impoundments. Shell noted that South Redclay Compensation Lake and associated infrastructure is parallel to the Athabasca River, and as such is not predicted to impede wildlife movement along the Athabasca River. Shell stated the areas for compensation lake infrastructure would be reclaimed and thus were predicted to have a negligible residual effect on wildlife populations in the region.

[563] Shell noted that ACFN's own expert had agreed with Shell that bison are not habitat-limited in northeast Alberta and that disease has been one of the reasons for historic population declines. Shell referred to EC's testimony that some wood bison populations in the region were actually increasing threefold. Shell said that if a species is declining in Alberta or across its

North American range but the cause of the decline is not associated with the Project or cumulative effects within the RSA, Shell's CEA would conclude that effects within the RSA were not significant.

[564] Dr. Jones, on behalf of ACFN, presented data from a current study he was completing on PAH concentrations in the bile of fish taken from the Athabasca River and Slave River at locations upstream and downstream of existing oil sands mining operations. Dr. Jones believed the data demonstrated that contaminants from oil sands operations are reaching the aquatic food webs of the Slave and Athabasca Rivers. However, Dr. Jones agreed that, based on the data, it did not appear that an increase in PAH concentrations in fish bile were correlated with incidences of lesions and other abnormalities in the collected fish or other aquatic health impacts. Dr. Jones also noted that increased PAH concentrations in fish bile were not a direct measure of human health risk because little or no bile is consumed by humans and that the relationship between PAH concentrations in fish bile and muscle tissue is not fully understood. Dr. Jones stated that human health risk could only be estimated from PAH concentrations in tissue consumed by humans and that these analyses were currently underway.

Analysis and Findings

[565] The Panel acknowledges that Shell concluded that there would be negligible cumulative effects on fish habitat at the local and regional level based on its proposed mitigation and NNLP compensation.

[566] The Panel understands that DFO concurred with Shell's observation that impacted species in the upper Muskeg River are not important target species and that any fish and fish habitat losses from the upper Muskeg River can be accommodated through offsite compensation efforts.

[567] The Panel notes that DFO asked the Panel to recommend that Shell conduct a CEA on downstream fish habitats and that it develop and implement, in collaboration with Aboriginal groups, industry, and government, initiatives to detect, monitor, and adaptively manage cumulative effects on fish habitat in the Lower Athabasca River watershed, and if adverse effects continue to be found, to mitigate or offset those effects. The Panel does not believe that a single proponent should have to complete this CEA or monitoring and instead recommends that DFO lead the CEA on downstream fish habitats and the monitoring. The Panel refers to the Regional Effects section of this report for further discussion on this issue.

[568] The Panel finds that no significant cumulative effects are expected because no target species of direct interest identified in the upper Muskeg River reaches would negatively affect downstream productivity in the Athabasca River.

[569] The Panel notes Shell's claim that the fish habitat compensation works are parallel to the Athabasca River, and Shell predicted that there will be no impedance to wildlife movement along the Athabasca River.

[570] The Panel finds that little evidence was provided about the importance of bison habitat where the compensation lake is proposed. The Panel is of the view, however, that the compensation works could affect habitat for the Ronald Lake Herd, the only herd in the RSA that Aboriginal persons are allowed to hunt. Without identification of critical habitat through a

recovery strategy, it is difficult for the Panel to assess the importance of the area of the Redclay Compensation Lake for meeting the objectives of the recovery of the wood bison population, and hence the significance of environmental effects. Accordingly, the Panel recommends that the Government of Canada determine whether the habitat in the area of the Redclay Compensation Lake where the compensation lake is proposed is critical for the survival of the Ronald Lake Bison herd. In the event the federal recovery strategy for wood bison includes critical habitat in the area affected by the NNLP, the Panel recommends that the Government of Canada and Shell work with other key stakeholders, including the Government of Alberta and Aboriginal groups that use the area for hunting wood bison, to modify the NNLP to avoid or minimize the effects on bison habitat.

[571] The Panel understands that the study undertaken by Dr. Jones is not yet complete and that further analysis of the results is ongoing. The Panel does not find the results presented to be very compelling or conclusive at this stage. While it does appear that there is an increase in PAH concentration in fish bile immediately downstream of the oil sands mining areas, it is not clear how or whether the study can distinguish between PAHs that may be originating from oil sands mining operations or from natural bitumen outcrops in the bed and banks of the Athabasca River, or other sources. The Panel notes that the data do not seem to support a correlation between PAH concentrations in fish bile and lesions or other abnormalities in fish. It is not known whether there is a correlation between PAH concentrations in fish bile and muscle tissue, and therefore whether there is a link between PAH concentrations in bile and human health risks. The Panel believes that Alberta should consider concerns related to PAH and fish bile once the results of Dr. Jones's studies are finalized.

EFFECTS OF TAILINGS PONDS ON MIGRATORY BIRDS

Evidence

[572] Shell noted that migratory bird landings in tailings ponds occur in the oil sands and were a possibility for the Project. It noted that incidents were more prevalent during inclement weather. To prevent birds from landing on the ponds, Shell stated that it employs a deterrent system that detects approaching birds and engages a hazing device to dissuade birds from the area. Shell stated that the effectiveness of this system was 96.9 to 99 per cent, based on tests conducted by the manufacturer. Shell noted that this technology is more effective than a random radar system, where hazing actions are emitted at random intervals, because it prevents habituation.

[573] Shell stated that the deterrent system is fully operational and, in the case of power failure, would "fail on," sending continuous blasts. Shell stated that it had planned no other adaptive management. ACFN noted that the "fail on" mechanism did not work in 2007 when 16 bird mortalities were reported in one of Shell's tailings ponds. Shell stated that this was due to a radio communication board failure and not due to a malfunctioning unit.

[574] In determining the effects of tailings ponds on migratory birds, Shell said that the magnitude of effect of a typical bird group landing in a tailings pond would be slight for most populations of species at risk, and minor for whooping crane. Shell stated that in 2011, the total number of birds recovered from all the tailings ponds in the oil sands region was 70 birds, most of which were ducks. Shell said that any bird mortalities are unfortunate. It stated that it was

working to prevent these mortalities from occurring. It concluded, however, that the number of birds impacted by tailings ponds is insignificant when compared with wind turbine kills and hunting.

[575] ACFN stated that operators have not effectively managed bird-oiling events in the past and that there is still an inadequate capability to manage the risks that tailings ponds pose to birds, particularly in inclement weather.

[576] ACFN noted that the oil sands region is in a migratory bird route. It stated that it was concerned about the increase in the number of tailings ponds on the landscape. ACFN stated that in 1992 there were 22 km^2 of visible industrial water bodies; in 2008 that area had increased to 80 km^2 and would increase to 121 km^2 with the addition of the Project.

[577] ACFN noted that more tailings ponds and less natural wetland may translate into increased usage of tailings ponds by migratory birds, which may result in potential health effects if these birds are consumed by local people.

[578] ACFN showed bird mortality incidents for more than 40 bird species, noting that some of the species are listed or are important resources for local First Nations. ACFN also referenced a study by Dr. Cassidy-St. Clair that demonstrated that in 2011, 3565 birds landed on PAW ponds (including tailings, recycle water, emergency dump ponds, and any other water that may contain harmful or hazardous materials) at five oil sands operations, and 2408 of those birds belonged to the duck group. It noted that the total number for the JPM and MRM projects was 767 birds. ACFN noted that birds were able to fly away in many of these cases but worried that the reproductive fitness of birds exposed to PAW may be reduced. ACFN noted that indirect mortality in the oil sands was unknown because these fly-away birds are not monitored. Shell said that monitoring of birds that come into contact with tailings ponds is very challenging. EC agreed that monitoring off-site mortality would be difficult but is nevertheless important for fully understanding the impact of tailings ponds on migratory birds.

[579] MNA and ACFN stated that migratory routes of bird species may be changing due to oil sands development and noted that air pollution from the stacks, loss of vegetation, presence of reflective metal, and noise may be contributing to these changes. EC confirmed that migratory patterns may be shifting, but it has not formally documented this shift. It stated that the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* has proposed evaluating this matter.

[580] EC noted that whooping cranes are one of the most endangered species in North America. It said that approximately 48 per cent of the population may migrate over the oil sands region. Shell noted that whooping cranes are unlikely to land in tailings ponds because they prefer to land on land as opposed to open water and that no whooping cranes have been found in tailings ponds to date. EC stated that they have, however, been detected flying over and landing near the Project LSA. EC stated that if mortality occurs, it could have significant negative population-level consequences because of the small size of the whooping crane population. In a modelled population viability analysis, EC estimated that the minimum viable population size of whooping cranes over a span of 100 years is 40 breeding pairs. EC stated that in 2012 it recorded 66 pairs, which is less than the 75 pairs reported in 2011.

[581] EC agreed that the Project activities and infrastructure, on their own, would not likely result in sufficient wildlife mortality to have population-level consequences for most migratory bird species at the scale of the RSA, given the low mortality rates reported at tailings ponds in recent monitoring programs. However, EC noted that effects on migratory birds must be avoided in order to comply with the *Migratory Birds Convention Act, 1994* (*MBCA*) and that it was particularly important to avoid mortality of species at risk such as, whooping cranes. As a result, EC recommended that Shell implement all possible measures to avoid the potential for migratory bird mortality related to the Project, including removing surface oil from tailings ponds to the extent possible.

[582] EC stated that there are deficiencies or limitations with the deterrent system because migratory birds are still known to land, usually during inclement weather. EC was not aware of a process that would completely prevent those impacts, but strongly suggested that Shell contain the oil on its tailings ponds as additional mitigation to prevent birds from becoming oily if they land. Shell stated that it agrees that operations should be conducted to minimize potential contact of birds with residual oil in tailings storage areas, and it will look at the viability of residual oil removal at its operations. Accordingly, Shell stated it would provide findings to EC and ESRD with a recommended path forward.

[583] Shell developed a monitoring program to record fly-overs and landings on various water bodies in the area and is collaborating with the University of Alberta to conduct a risk assessment on these data. Shell hoped that the information collected would help determine higher-risk areas for bird landings and allow Shell to increase the deterrent and observation efforts at those sites. Shell committed to conform to any monitoring recommendation proposed by this study.

[584] Shell stated that workers spend thousands of hours per year conducting mortality searches. ACFN noted that while Shell stated that over 5000 employees contribute to search time during regular operations, Shell had reported only 160.4 hours of dedicated search time. ACFN noted that substantial variation occurs in bird detection among operators and recommended that independent monitors be involved in conducting these observations.

Analysis and Findings

[585] The Panel observes that the increasing prevalence of tailings ponds on the landscape in northeastern Alberta combined with a decrease in natural wetlands increases water hazards for migratory birds. The Panel notes that this issue is of particular concern for species with low abundance or identified as species at risk.

[586] The Panel finds that, in general, the deterrent system has been very dependable and effective. While any fatalities are regrettable, the Panel determines that the number of fatalities is an extremely small percentage of the total number of birds that are said to be migrating through the area and that this effect is not significant. The Panel finds that the potential effects of birds landing on tailings ponds are appropriately prevented and mitigated by the use of the deterrent system.

[587] The Panel notes that birds land on tailings ponds in inclement weather even with deterrent systems. The Panel has determined that in these cases, the recommendation by EC to contain and remove residual surface oil from tailings ponds on an ongoing operational basis

would reduce immediate mortalities and would help mitigate other types of effects of bird contact with oil. The Panel is satisfied with the approach suggested by Shell and recommends that the Governments of Canada and Alberta ensure that Shell evaluates the technical and economic feasibility for removing residual surface oil from tailings ponds.

[588] Although the Panel notes that the number of bird landings tends to be low and the birds tend not to be species at risk, the Panel believes that any effect on species at risk would be significant. The Panel notes that the buffer between the 2012 population of whooping cranes and the minimum viable population is 22 pairs. The Panel further notes that the number of pairs in the population decreased by nine between 2011 and 2012. Considering that the buffer is very small and the species appears to be in a decline, the loss of any individuals in the population would reduce the buffer and would increase the risk that the minimum viable population would be approached, unless the actual population increased otherwise. Should a species at risk land in a tailings pond, the Panel finds there to be a significant effect. The Panel notes that there have been no reported incidents of whooping cranes landing in tailings ponds and believes that the effect of tailings ponds on whooping crane to be not a likely one.

[589] The Panel finds that more information is required by industry in general on the effects of tailings ponds and other PAW on birds when mortality is not immediate. There is little or no information on the potential long-term effects on reproductive success or behaviour as a result of exposure to tailings ponds along migration routes and any resulting health effects from consumption by local people. Therefore, the Panel recommends that the Government of Canada consider if more information is required on the potential long-term effects on migratory bird reproductive success or behaviour as a result of exposure to tailings ponds along migration routes. The Government of Alberta should also consider if more information is needed on potential resulting health effects of consumption of hunted birds by local people. The Governments of Canada and Alberta, along with key stakeholders, should determine if studies are required to examine these issues.

[590] Similarly, the Panel notes that the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* has proposed to evaluate the possible change in bird migration patterns in the region. The Panel agrees that this information would be useful. If evidence shows that migration routes of birds are changing, the Panel is of the opinion that tailings ponds may not be the same continuing hazard to these birds in the future. However, as stated above, tailings ponds should still be considered hazardous to migratory birds and thus mitigated as recommended until such results are confirmed.

METHODS USED TO ASSESS EFFECTS ON TERRESTRIAL RESOURCES

Estimating Land Cover Composition and Wildlife Habitat Availability

Evidence

[591] To assess land cover composition, Shell used Landsat satellite imagery to quantify land cover types (e.g., percentage composition of old-growth forests and wetlands) present in the RSA. Shell said that the Landsat imagery used for the terrestrial RSA provided the best available data for this assessment because finer scale Alberta Vegetation Index (AVI) data were not available at the RSA scale, and that finer scales of habitat simply cannot be represented at a

regional scale. Shell also stated that even if finer-scale data (such as AVI) were available, the analysis would have been rendered too computationally intensive.

[592] EC stated that Landsat mapping cannot accurately describe habitat availability in the RSA, and it introduces a high level of uncertainty and potential error in Shell's predictions. EC stated that models derived from coarse-scale habitat mapping may overestimate habitat availability at the RSA scale resulting in a potential underestimation of project and cumulative effects. For example, EC noted that Shell's RSA mapping did not include forest stand age, an important determinant of habitat use by wildlife, including several species at risk. EC further stated that the Landsat data was flawed because it grouped much of the finer-scale habitats into broad habitat classes, negating the finer habitat units in favour of a coarser representation of the landscape. EC also stated that because Shell used coarser Landsat data, it considered that Shell's wildlife habitat model output had low predictive accuracy at the RSA scale. EC noted that other recent EIAs in the oil sands region have used more detailed habitat information at the RSA scale, but it did not identify the specific EIAs.

[593] EC recommended that Shell use the AVI data available for the RSA in order to increase predictive accuracy. EC also said that other sources of information could be used, including Phase 3 forest inventory available from the province of Alberta. EC indicated that when combined with field validation, this data would have provided some forest age-class information and would result in a much better prediction than using the coarse-scale habitat Landsat mapping. EC confirmed that it would be difficult to be precise about land-cover type and habitat availability, given the coarse-scale data used in Shell's analysis.

[594] When Shell was questioned about predicted levels of certainty in RSA land-cover mapping that used Landsat data, it responded that it believed the mapping was 75–80 per cent accurate.

[595] ACFN stated that the Landsat image classification cannot differentiate the impacts on patterned fens or between a marsh and an open bog. ACFN argued that Shell should have built detailed vegetation plots for verifying wetlands (including peat lands) and that without field verification the accuracy of preliminary vegetation maps was in question. ACFN also stated that it was unclear whether Shell had mapped vegetation in the RSA according to any standards that would coordinate Shell's effort with other ongoing regional mapping procedures.

[596] ACFN also submitted that Shell did not describe the accuracy of the AVI data used in the LSA models.

[597] In order to predict habitat availability in the RSA for wildlife under PIC, base case, application case, and PDC scenarios, Shell used habitat suitability index (HSI) models that relied on Landsat imagery for 11 key indicator resources (KIRs) and species at risk. Shell provided results from models that varied by species, depending on the amount of data available on species-specific habitat relationships. Shell explained that it developed the model for each species based on published data, expert knowledge, and professional judgment, all of which it used to interpret habitat relationships as index scores. Shell reported that there was a lack of field data for all 11 species, so it could not validate model predictions. Instead, Shell stated that it used professional judgment to check model output for conformation with the current state of knowledge about ecology and habitat preference for each species. EC stated that Shell should

collect additional baseline data on the distribution and abundance of wildlife species to better validate its predictions.

[598] FMFN's assessment concluded that the vast majority of wildlife habitat models (198 of 228) used in oil sands EIAs were not validated, not adequately documented, or did not perform well. FMFN stated that as such, predicted local impacts are likely inaccurate and, therefore, regional cumulative effects predictions are likely inaccurate as well because habitat models need to be validated and predictions confirmed. FMFN concluded that confirmation of predictions requires scientifically defensible wildlife surveys to determine habitat use and population densities in the oil sands region.

Analysis and Findings

[599] According to the Agency's *Cumulative Effects Practitioner's Guide*, if little or no information is available during a CEA or if uncertainty in predictions arise in a CEA due to variations in natural systems, a lack of information, or the inability of predictive models to accurately represent complex systems, any limitations this places on the assessment and any assumptions made must be clearly stated and the resultant uncertainty explained, otherwise it may later bring into question the usefulness of the CEA. The *Cumulative Effects Practitioner's Guide* states that, although uncertainty can arise in CEA predictions, a record or audit trail of all assumptions, data gaps, and confidence in data quality and analysis should be given to justify any conclusions.

[600] The Panel is of the opinion that use of Landsat imagery for estimating land-cover type is a concern in the context of modelling available habitat (e.g., wetlands and old-growth forest) in the RSA and adds substantial uncertainty to Shell's predictions of habitat availability in base case, application case, and PDC scenarios. This is compounded by the fact that Shell did not present any measures of error for its predictions in the EIA. The Panel notes that the provincial TOR requires that the proponent include a "description of the deficiencies or limitations in the existing environmental databases, how deficiencies and/or limitations were addressed, and their impact on the analysis and any appropriate follow-up."

[601] During the hearing, Shell estimated the measure of error associated with the use of Landsat imagery to be ±20–25 per cent based on its professional judgment. Given Shell's reliance on professional judgment, the Panel is unable to assess the accuracy of this error estimate for the purposes of its assessment but has used the estimate in considering the potential effect of this uncertainty on Shell's predictions and the possible significance of project effects.

[602] The Panel believes that Shell's use of Landsat imagery for predicting availability of wetlands and old-growth forest at the base case results in uncertainty in current EIA models of wetland and old-growth forest availability in the RSA. It appears to the Panel that this uncertainty in current models was subsequently propagated into Shell's predictions of pre- and post-closure wetland and old-growth availability in the RSA, making it difficult for the Panel to assess the significance of cumulative effects on old-growth forest and wetlands. The Panel believes that Shell's predictions of wetland habitat and old-growth forest availability in the RSA under all scenarios should be subject to ±20–25 per cent rates of uncertainty/error. The Panel therefore concludes that it is possible that Shell's predictions represent overestimations of the amount of wetland habitat (particularly peat land) and old-growth forest that will be present in the RSA in the application case and the PDC. Although the Panel understands that under-

estimations resulting from ±20– 25 per cent error may be equally possible, given the requirement by *CEAA, 2012* to consider EA decisions in a precautionary manner, of greater concern for decision-making is the potential for overestimations of existing habitat availability.

[603] The Panel believes that the aforementioned uncertainty related to Landsat imagery was also propagated throughout Shell's EIA in all of its HSI models for predicting wildlife habitat availability at base case. Each of Shell's HSI models included the Landsat error at base case (±25 per cent) plus any additional error associated with the modelling exercise (i.e., no HSI model will provide a perfect representation of species habitat preferences, with the degree of certainty dependent on the amount of information available and, varying greatly by species). The Panel notes that Shell did not provide an estimation of the error associated with each species HSI model output at base case. The Panel realizes that had Shell been able to validate the models using field data, certainty around model output would be greater. The Panel also notes that despite EC's suggestion during the SIR process that Shell collect additional baseline data to validate its EA predictions, for all 11 species modelled by Shell, none had sufficient field data for appropriate model validation. Therefore, given that error is additive, the Panel concludes that each HSI model output could have an overall error rate associated with Shell's predictions of habitat availability at base case that is greater than 25 per cent. And, because Shell then projected this same Landsat data into future scenarios (application case and PDC), model uncertainty may increase because these cases are subject to other predictions that are also uncertain (e.g., reclamation plans, lease boundaries, market values, etc.).

[604] The Panel notes that Shell did not present measures of uncertainty for AVI data that it used for predictions about wetland habitat use in the LSA. However, the Panel finds that this is not as serious a concern given that this data is of a finer scale of accuracy than the Landsat data, therefore the degree of confidence is greater.

Determination of Significance

Evidence

Study Area Size and Configuration

[605] Shell stated that its RSA was 2 277 376 ha and that the Project footprint (excluding Phase 1) was about 13 291 ha. Shell originally developed the RSA to encompass both the proposed PRM and the Project. Shell stated that discipline-specific experts developed RSAs to represent areas in which project effects could overlap with the effects of other activities in a non-trivial way. FMMFN #468, ACFN, and EC said that Shell's RSA was too large to be able to conclude significance for many impacts, including changes to wetlands and habitat availability for wildlife. They indicated that because of the large size of the RSA, local project effects were diluted and less likely to be determined to be significant at the regional scale. ACFN suggested that the larger the RSA, the smaller the apparent contribution of each action.

[606] Shell chose the RSA based on a number of considerations, including the following:

- at least two moose home ranges,
- the boundaries of natural regions and vegetation classifications,
- the defined woodland caribou habitat areas,

- the further potential measurable effect in combination with approved and planned projects in the region, and
- inclusion of the community of Fort McMurray and other areas likely for future community expansions.

[607] Shell predominantly presented project effects on wildlife habitat availability in the context of the RSA as opposed to the LSA. Both OSEC and EC stated that Shell's approach to assessing significance was flawed given that it was difficult to evaluate the importance of effects on the local area and that the assessment of significance of project effects should be focused on the LSA. EC supported OSEC's position, stating that project effects should have been evaluated at both the local and regional scales to provide a complete understanding of project effects and appropriate mitigation measures. ACFN also said that Shell did not justify the methods it used to assess significance.

[608] Shell's LSA included the development areas of both Phase 1 (7511 ha) and the Project (13 291 ha), for a total development area of 20 802 ha. Shell also included a 500 m offset buffer in its LSA to account for indirect effects of the Project, for a total LSA size of 29 624 ha. According to Shell, the buffer zone varied in width depending on the configuration of the Project development area. Shell's assessment of project effects on terrestrial resources included a consideration of the effects of Phase 1, the Project and the buffer.

[609] EC stated that it was unclear whether Shell had combined the effects of the Project with Phase 1 when evaluating the effects of the Project on all terrestrial indicators, namely species at risk. EC further stated that this approach did not allow for an accurate assessment of additional habitat loss as a result of the expansion alone, or for the determination of appropriate mitigation measures for any additional habitat loss.

Thresholds

[610] Shell stated that it considered cumulative effects on wildlife to be significant if they compromised resilience such that populations were no longer likely to be self-sustaining, ecologically effective populations.

[611] EC stated that it was very difficult to know at what point of habitat loss a species was no longer self-sustaining and ecologically effective, making real-world application difficult. EC also stated that Shell's assessment misrepresented how significance was typically determined in environmental assessments, namely that significance should be based on the context of the local and regional wildlife populations, as indicated in the TOR. EC said that the scope of the EIA should be the LSA and the RSA, but that Shell had expanded this to include larger scales of reference, e.g., provincial and national. EC stated that determinations of significance resulting from comparisons with these considerably broader scales can be very misleading and, as such, stated that it was not satisfied with Shell's determination of significance.

[612] OSEC noted that in the Total Joslyn North Mine Project Decision (*ERCB Decision 2011-005*), that Panel used a 20 per cent habitat loss threshold to determine significant effects on wildlife. That Panel also considered that any effects on species at risk were significant. OSEC also submitted that widely available guidance on critical habitat thresholds or disturbance thresholds was available in CEMA's *Terrestrial Ecosystem Management Framework (TEMF)*, which suggests that the level of disturbance to wildlife should be under 10 per cent of natural

range of variability (NRV). OSEC noted that if Shell had used the guidance in the *TEMF*, it would have concluded that at the RSA level, 13 of 19 species would be subject to significant effects. OSEC also stated that Shell failed to consider in its assessment the Fort McMurray IRP guidance on thresholds, including a population target for moose. OSEC stated that despite all three of these potential sources of available thresholds, Shell did not make use of thresholds to determine the significance of effects in its assessment.

[613] During the SIR process EC asked Shell to calculate the NRV of habitat and wildlife populations in the RSA and compare habitat availability and estimate population size at the base case, application case, and PDC in order to inform the analysis of environmental consequence and significance of cumulative effects. Shell indicated that it did not include the NRV in its assessment of significance. Shell referred to the concept of critical habitat thresholds as reported in the scientific literature, indicating that habitat loss of up to 70 to 90 per cent may be required before a critical habitat threshold is reached. Shell explained that any change of more than 20 per cent in the measurement end point was considered a high-magnitude change. However, EC stated that Shell described a 40 per cent loss of habitat for caribou as being a low magnitude effect. OSEC argued that the critical threshold approach, which could take a species to the brink of extinction before corrective measures were initiated, was inconsistent with *CEAA, 2012* and *SARA*, both of which require that the precautionary approach be taken. EC stated that the 70 to 90 per cent threshold is not precautionary, and that thresholds can vary depending on several factors, including the specific species and the study area. EC also stated that there was much uncertainty around thresholds and that habitat loss in the range of 20 to 40 per cent can be enough to change a population trajectory.

Professional Judgment

[614] Shell stated that it used professional judgment to determine significance of effects on terrestrial resources, including wildlife habitat. Shell said that it based its EIA methodology on the TOR for the Project, guidance from the Agency, methodologies recommended by the CEMA, and standard environmental assessment practices.

[615] OSEC and ACFN did not agree with Shell's means of assessing significance of effects on terrestrial resources, and in particular, argued that Shell relied too heavily on the professional judgment of Golder and did not use clear thresholds to make significance determinations about effects on terrestrial resources. OSEC argued that if the proponent's professional judgment was unsupported by evidence, it should be disregarded by the Panel. ACFN said that Shell did not clearly indicate what factors it considered in making the professional judgments that led to significance determination or how judgments may have been peer reviewed or verified by different parties or processes. ACFN further stated that clear thresholds should be used for determining significance in order to balance and improve significance evaluations.

[616] In response, Shell stated that in the absence of frameworks under *LARP*, no applicable thresholds for assessing the effects of the Project are mandated by government policy or regulation

Ecological Context

[617] The Project footprint is immediately adjacent to a number of other existing and approved oil sands mines, including Shell MRM, Syncrude Aurora North, Syncrude Aurora South, FHOSP, and Imperial KOSP.

[618] OSEC and FMMFN #468 said that Shell should have included ecological context in its assessment of significance. FMMFN #468 said that Shell had not appropriately considered ecological context in its methodology. OSEC said that the true ecological context that Shell should have used was an LSA and RSA that has been and would be further adversely affected by industrial development, particularly given that Shell had stated that the LSA would be completely disturbed during the life of the Project, with the exception of the 500 m buffer.

[619] Shell said that it did look at the ecological context by looking at best available knowledge pertaining to each species, such as population trajectories and amount of habitat remaining near the study area. Shell indicated that it did a wider search for available data at the provincial or national level if that data was not available for the vicinity of the study area.

Analysis and Findings

[620] The Panel notes that Shell often considered Project effects in terms of the effect on the RSA, whereas the Panel is of the opinion that the significance of project effects needs to be considered at the LSA and RSA scales.

[621] The Panel notes that Shell originally chose the RSA to encompass both the PRM and the Project, but that Shell did not change the RSA size even after it assessed PRM and the Project separately. The Panel believes Shell's RSA size is inappropriate for the Project alone. The large proportional difference in the ratio of the LSA to RSA causes a "dilution effect", whereby the effects of the Project essentially get lost in the very large RSA, making it difficult to determine the significance of effects (e.g., loss of wildlife habitat) of the Project on the RSA. The Panel also finds that this dilution factor is problematic when using Shell's determination of significant project effects, and therefore the Panel was unable to rely on Shell's determinations of significance.

[622] The Panel finds it noteworthy that Shell did not appear to use any of the available thresholds when it made its determination of significance for effects on wildlife (e.g., *TEMF*, Fort McMurray IRP, or thresholds used in the *ERCB Decision 2011-005*). Instead, Shell based decisions largely on professional judgment and, in some cases, on information on specific species trends at a broader scale (RSA, provincial, or greater). The Panel believes that had Shell used some of the available thresholds, it would likely have determined that some effects related to wildlife habitat loss were significant and adverse.

[623] The Panel acknowledges that the *Cumulative Effects Practitioner's Guide* states that the assessment of cumulative effects is often hindered by a lack of thresholds, particularly for terrestrial components of ecosystems. The Panel notes that the Guide advises that in the absence of defined thresholds, the practitioner can: 1) suggest an appropriate threshold; 2) consult various stakeholders, government agencies, and technical experts (best done through an interactive process such as workshops); or 3) acknowledge that there is no threshold, determine the residual effect and its significance, and let the reviewing authority decide if a threshold is exceeded.

[624] The Panel believes that Shell's rationale for deciding what constitutes a significant effect is unclear and largely based on professional judgment, not on existing thresholds from guidance documents and scientific literature. The Panel notes that Shell has stated there was a lack of clear, established thresholds for terrestrial resources, and therefore it appears that Shell has decided to take the third option described in the Guide as stated above. The Panel will therefore determine which thresholds are appropriate for assessing the significance of project effects.

[625] The Panel believes that when addressing uncertainty, conclusions should be made conservatively, employing the precautionary principle where appropriate. *CEAA, 2012* includes a requirement to ensure that designated projects are considered in a careful and precautionary manner to avoid significant adverse effects. Consequently, where there is an absence of agreement on appropriate thresholds for assessing the significance of project effects, the Panel will use the 20 per cent loss threshold adopted by the Joslyn North Mine project JRP and recommended in the *TEMF* for assessing the potential significance of habitat loss.

[626] Although the Panel used the 20 per cent loss threshold as a general guide when making decisions about significance, the Panel recognizes that the overly large size of the RSA makes it difficult to base such decisions solely on the numerical and other predictions for the RSA provided by Shell given its methods.

[627] The Panel notes that the Agency's *Guide to Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects* (November 1994) advises that ecological context of the area to be developed should be considered as a criterion for determining whether a project has significant effects. Specifically, the Guide states that, "The adverse environmental effects of projects may be significant if they occur in areas or regions that have already been adversely affected by human activities, and/or are ecologically fragile and have little resilience to imposed stresses."

[628] Although Shell maintained that it did consider ecological context, the Panel believes that Shell's use of ecological context was not consistent with the approach outlined in the Agency's guidance because it did not explicitly discuss the effects of existing and approved projects immediately adjacent to the proposed Project, nor did it address the fragility of the area to be affected (e.g., lenticular patterned fen). The Panel is of the view that had Shell appropriately considered the ecological context of the Project, it would have recognized that the Project occurs in an area already adversely affected by human activities given that the Project footprint is nearly surrounded by numerous existing and approved oil sands operations, including Shell's MRM and JPM Phase 1 mines, Syncrude's Aurora North and South mines, FHOSP, and Imperial's KOSP.

[629] Although a number of other mine projects are close or directly adjacent to the Project's footprint, Shell did not consider these mines to be contributing to effects on terrestrial resources at the LSA scale and considered them only at the RSA scale in the cumulative effects context. The Panel also finds that the 500 m buffer around the Project footprint used by Shell to define the LSA is not particularly useful and only further confuses the interpretation of local project effects. By adding a 500 m buffer to the Project footprint to define the LSA, Shell gives the impression that an area around the Project footprint will be undisturbed during operations. However, the Panel understands that the Project shares boundaries with other oil sands projects and that the 500 m buffer includes lands that are not on Shell's lease. Hence the lands in the buffer may be developed in the future and not maintained intact (e.g., wetlands or old-growth)

for wildlife habitat. This lack of clarity about the role of the LSA buffer during Project operations has increased the Panel's difficulty in interpreting and assessing the effects on terrestrial resources.

[630] The Panel believes that the way in which Shell defined the LSA to include both the approved JPM Phase 1 mine and the Project footprint makes it difficult to assess the effects of the Project alone at the LSA level. For example, the results presented by Shell propose a 40 per cent loss of old-growth forest from the Project. However, given that the remainder of the LSA is made up of the Phase 1 mine site, plus a 500 m buffer that is not intended to be protected from development, it is unlikely that the other 60 per cent of old-growth forest in the LSA will be maintained. The proposition that only 40 per cent of old-growth will be destroyed is not a reasonable interpretation of Shell's information. Another example is provided by table 4.3-1 of appendix 1 in Shell's May 2012 submission, which indicates that 12 613 ha of wetlands will be directly and indirectly lost or altered by the expansion and Phase 1 projects but does not indicate how many hectares are attributed to each project.

[631] The Panel believes that Shell's methods for determining effects of the Project and cumulative effects on wildlife habitat are problematic given Shell's reliance on Landsat data, the lack of measures of uncertainty, and the size of the RSA. The Panel believes that the interpretation of local project effects is flawed given the size and configuration of the LSA and its buffer. The Panel further believes that Shell's determination of significance of effects on wildlife habitat is unclear due to the overuse of professional judgment, its failure to use existing thresholds, and the lack of ecological context. As such, the Panel relied on the evidence provided and tested and employed its own analysis to make determinations regarding significance of Project and cumulative effects on terrestrial resources. When evaluating Shell's predictions for significance, the Panel took into account Shell's numerical prediction, the RSA dilution factor, and the potential uncertainty around the prediction.

EFFECTS ON WETLANDS

Project Effects

Evidence

[632] Shell stated that 47 per cent of the land cover in the LSA is wetlands. Shell's plans propose removing all wetlands in the proposed development area. According to Shell, from base case to application case, 12 613 ha of wetlands (91 per cent of the resource) will be lost or altered due to land clearing and the indirect effects of groundwater drawdown, leaving 1282 ha of wetlands at closure. Of the 12 613 ha of wetlands that will be lost, 85 per cent are peatlands (i.e., bogs and fens). Shell stated that it would reclaim 3618 ha of wetlands post-closure, but confirmed that peatlands cannot be reclaimed.

[633] Shell noted the presence of a large lenticular patterned fen (642 ha) in the northeast corner of the Project area and stated that 16 per cent of it would be directly affected by mine clearing and the remaining 84 per cent by drawdown. Shell stated that the fen contains a special plant community, and is the only known community of its kind in the RSA. Both Shell and Imperial identified this fen as a special plant community KIR due to its unique landform characteristics.

[634] According to OSEC, wetlands provide several key ecological services and special functions including the accumulation of carbon (sequestration), the slowing of water runoff allowing for longer time intervals for groundwater recharge, and the moderation of storm water runoff and attenuation of flood pulses. OSEC also maintained that wetlands are important for the maintenance of water quality, and that the natural microbe communities of wetlands can transform, sequester, bind, and isolate many undesirable materials (e.g., contaminants) from the water column, thereby purifying the water. OSEC emphasized that wetlands are also disproportionately valuable for wildlife, concentrating insects, fish, birds, and mammals in closely linked food chains. According to OSEC, the Project is not in the public interest because losses of wetland habitat would translate into significant effects on wildlife and on several species at risk and migratory birds.

[635] EC stated that loss of peatlands and limitations on reclamation are among its primary issues and concerns. EC recommended that Shell experiment with peatland reclamation and report on successes and challenges. EC expressed particular concern regarding the loss of the unique lenticular patterned fen, indicating that the graminoid fen matrix may provide suitable habitat for several federally listed species, including yellow rail. EC recommended that Shell identify and implement measures that avoid the effects of drawdown on the lenticular patterned fen and, in particular, on yellow rail habitat during Project construction and operations.

[636] Shell outlined potential mitigation measures that could minimize drawdown effects on the fen, including establishing a mine setback or constructing an engineered mitigation such as a barrier and pumping system designed to mimic natural water levels and flows in the fen. Shell stated that it did not propose specific mitigation to avoid drawdown effects on the lenticular patterned fen during construction and operations, but confirmed that it has already committed to monitoring the fen as part of its wetland monitoring program. Shell discounted the mine setback option as it would sterilize bitumen in the northern part of the mine. During the SIR process, Shell discounted the engineered mitigation method based on suggestions by third-party experts that success of such measures would be low due to a lack of understanding of the complex relationship between natural water levels and flow in the fen. Shell acknowledged that FHEC was developing strategies to minimize effects of its operation on the McClelland Lake Fen, but Shell did not believe that this strategy can be applied to the lenticular patterned fen.

[637] Shell stated that the reclaimed landscape would include a greater proportion of upland habitat and open water compared with predisturbance levels of wetlands. As a result, Shell stated that there would be more habitat area for some species (i.e., those that prefer uplands) and less for others, particularly wetland-dependent species. However, Shell said that wildlife that dependent on wetlands would have ample habitat in the RSA and that habitat loss in the LSA should not be a significant issue. While EC agreed with Shell's conclusion that the Project would not likely cause a significant adverse effect on habitat availability for species at risk at the scale of the RSA, it accorded this to the difficulty of assessing LSA effects within the large size of the RSA given that local project effects become diluted and are thus unlikely to be considered significant on their own at the regional scale.

[638] EC and OSEC both stated that reclamation of peatland habitats is not currently possible in the mineable oil sands region or will be limited by landform topography in the final reclaimed landscape, resulting in permanent habitat loss for species that occupy peatland habitats. EC stated that because peatlands cannot be reclaimed, the reclaimed landscape would shift from a

lowland-dominated ecosystem before development to an upland-dominated ecosystem after closure, resulting in a shift in the wildlife community. ACFN also expressed concern about the permanent loss of most of the wetlands in the LSA and the availability of habitat for wetland-dependent species. EC further stated that effects on wetland-dependent species such as the yellow rail may be permanent given the limitations in reclaiming peatland habitat. EC submitted that effects would be likely in the LSA and that they need to be mitigated based in part on the requirements of *SARA*. EC suggested that in the event that Shell's proposed mitigation measures cannot reduce the loss of habitat, measures such as conservation allowances may be considered to mitigate the residual effects of the Project on habitat loss for species at risk and migratory birds, especially those that use wetlands (e.g., yellow rail, horned grebe, and rusty blackbird). ACFN recommended that the Panel set approval conditions to address the re-establishment of diverse habitats similar to those that existed before disturbance, including monitoring to demonstrate the progress in achieving these habitats and the use of the reclaimed land by wildlife and fish species.

[639] OSEC, EC, and ACFN said that Shell should implement conservation allowances (also referred to as habitat offsets) to compensate for the loss of wetland habitat in the LSA. OSEC asserted that despite irreversible loss of peatlands and loss of habitat for numerous species at risk, and despite EC's observation that Shell had not provided enough mitigation for these effects, Shell had refused to consider conservation offsets. OSEC recommended that Shell implement an offset mitigation strategy in which Shell would restore degraded wetlands or purchase and conserve existing wetlands that would otherwise be degraded or destroyed. OSEC said that the Panel should require that the Project follow the guidelines in Alberta's current wetland policy for the White Area (the settled portion of Alberta): a requirement of a 3:1 ratio for replacement wetland area to disturbed wetland area. EC recommended that Shell refer to the design criteria outlined in EC's *Operational Framework for Use of Conservation Allowances*.

[640] Shell stated that it did consider offsets but rejected them on the basis that they were not required as part of its mitigation because the effects of wetland habitat loss on wildlife would not be significant, with the exception of effects on woodland caribou. Shell further stated that the Project, independently, would not likely result in any significant adverse effects, and therefore project-specific offsets were not necessary. Shell also indicated that it looks to the Government of Alberta for direction on the need for and use of conservation offsets but that the use of such offsets is not required under current policy guidance such as the *LARP*.

[641] Shell acknowledged that peatlands cannot be reclaimed but said that loss of wetlands will be mitigated through reclamation and availability of wetlands in the RSA. Shell stated that it would construct large wetlands according to the *Guideline for Wetland Establishment on Reclaimed Oil Sands* (CEMA 2007) that would provide a number of important functions in the closure landscape, including habitat provision, run-off flow attenuation, biodegradation, and sediment capture. Shell stated that its wetland reclamation plans include strategies considering succession and sustainability of wetland ecosystems, and as such, Shell proposed that specific areas such as depressional landscapes and areas surrounding closure drainage features would be revegetated with wetland species. Shell indicated that it would expect these areas to evolve into wetland in 10 to 30 years. Shell stated that loss of wetlands is not irreversible. Shell also stated that it is currently providing funding and participating in studies spearheaded by Syncrude and Suncor to construct peatlands on reclaimed mine areas.

[642] According to OSEC, site clearing and groundwater drawdown significantly change soil salinity and hydrology. OSEC further stated that the best reclaimed wetlands on process-affected oil sands mining sites to date are salt marshes that are low in species biodiversity compared with the freshwater peat wetlands, which predominate in the predisturbance landscape. OSEC provided a journal article by Rooney et al in which the authors assert that peat wetlands destroyed by open pit mining will not be replaced given the constraints imposed by the post-mining landscape (greater topographic variation and large elevated landforms) and the sensitivity of peatland vegetation to high conductivity and ion concentration of the salt, metals, and naphthenic acids present in the post-mining landscape. OSEC also said that the closure landscape would have an increased susceptibility to forest fires due to a drier landscape caused by a loss of peatlands and increase in uplands.

[643] The NSFMFM and Clearwater Band expressed concern that the removal of peatland would result in a drier environment and warmer water temperatures due to the loss of the cooling effect of slowly thawing peat. The NSFMFM and Clearwater Band believed that warmer water would have an adverse effect on aquatic life.

Analysis and Findings

[644] The Panel notes that wetlands are the dominant landcover type in the LSA, that a large proportion of the wetlands are peatlands (85 per cent), and that the Project will affect 91 per cent of wetlands in the LSA. The Panel is aware that there is currently little evidence that peatlands can be successfully reclaimed.

[645] The Panel makes particular note of the loss of the lenticular fen in the northeast corner of the LSA given its high biodiversity value and its uniqueness in the RSA. The Panel accepts that Shell has explored means to mitigate dewatering of the lenticular fen, but it also understands that work may be ongoing elsewhere in the oil sands region may offer potential alternative mitigation measures. The Panel believes that Shell should continue to explore these options.

[646] The Panel recognizes the concerns of interested parties about the irreversible loss of peatlands and the lenticular fen, given the essential ecosystem services provided by these habitats.

[647] The Panel believes that the clearing of the Project area will result in substantial loss of wetlands and particularly peatlands and this will result in a landscape shift from a predominantly wet, lowlands-dominated ecosystem before disturbance to a drier, uplands-dominated ecosystem after Project closure. The Panel notes that the lack of mitigation measures proposed by Shell that have been shown to be effective and the inability to reclaim wetland habitats to their former ecosystem function and biodiversity contribute significantly to this outcome. Particularly concerning to the Panel is the complete and irreversible loss of the lenticular patterned fen, a land-cover type found in the LSA and nowhere else in the RSA.

[648] The Panel also understands that wetlands provide habitat for a large number of species at risk and migratory birds, and as such, the loss of wetlands will result in habitat loss for many of these species, particularly the yellow rail, but also the horned grebe and rusty blackbird. The Panel notes Shell's assertion that habitat in the RSA will provide sufficient mitigation for wildlife habitat loss in the LSA; however, the Panel does not believe that Shell has provided evidence to support its view that habitat in the RSA is well below carrying capacity and will

effectively mitigate the loss as discussed in the Effects on Wildlife and Their Habitat section. Also, as discussed in the Methods Used to Assess Effects on Terrestrial Resources section, the Panel notes that Shell's projections of available wetlands in the RSA are subject to a fair degree of uncertainty, and Shell's determinations of significance for project effects are based on the relative amount of wetlands and peatlands in the RSA, and involves a large dilution factor due to the size of the RSA.

[649] The Panel acknowledges that Shell has committed to

- reclaiming wetlands on depressional landscapes and areas surrounding closure drainage features,
- reclaiming wetlands according to the *Guidelines for Wetland Establishment on Reclaimed Oil Sands* (CEMA 2007), and
- continuing participation in peatland reclamation research on disturbed oil sands mining lands and continuing reporting its progress in annual environmental performance reports.

[650] The Panel recommends that the Governments of Canada and Alberta ensure that Shell meets its commitments related to reclamation of wetlands, continues to research peatland reclamation strategies, and updates its reclamation plans accordingly.

[651] The Panel is also concerned that loss of peatlands may negatively affect species at risk, and as outlined in the *SARA-CEAA* guide (EC and PCA 2010), the obligation to identify and mitigate adverse effects on listed wildlife species is independent of the likely significance of the adverse effects. The Panel is of the opinion that Shell has not proposed mitigative actions for wetland habitat loss that will mitigate effects on *SARA*-listed species.

[652] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of project effects on wetland habitat in the LSA:

- The likelihood of the loss of wetlands in the LSA is **likely**—the Project footprint will be cleared and post-reclamation landscape will not be the same as base case.
- The magnitude will be **high**—given a 10 000 ha loss of wetlands, 85 per cent of which are peatlands that cannot be reclaimed.
- The geographic extent is **regional**—given that the lenticular fen in the LSA is the only one in the RSA. Furthermore, the effects of drawdown as a result of the Project will extend beyond the LSA, as will the potential effects on the greater ecosystem of the oil sands region, such as increased forest fire risk and loss of wildlife habitat for species that range broadly throughout the RSA.
- The duration is **long-term**—given that the time frame for wetlands to return to their former biodiversity and function is more than 80 years and peatland restoration has not been demonstrated for oil sands projects.
- The effects are largely **irreversible**—given that there is no evidence that peatlands can be successfully reclaimed.

- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, and some wetlands are particularly fragile given their inability to be reclaimed (e.g., lenticular fen). The Project footprint is immediately adjacent to other existing and approved oil sands mines (e.g., Shell Muskeg River, Syncrude Aurora North, and Imperial Kearl Lake).

[653] Given the aforementioned analysis, the loss of more than 20 per cent of the wetland resource, the inability to reclaim peatlands, and the effects on species at risk and migratory birds (as discussed in the Effects on Wildlife and Their Habitat section), the Panel finds a significant adverse project effect on wetlands (namely peatlands) in the LSA.

[654] The Panel expects Shell to comply with the new Alberta wetland policy currently under development and highlighted in *LARP* when finalized and implemented. The Panel understands that this policy will include a variety of wetland management tools, such as an offset program that seeks to counterbalance the loss of wetlands where adverse effects are unavoidable. The Panel also recommends to ESRD that Shell be required to fully comply with the *LARP* biodiversity management framework once complete.

[655] The Panel understands that few options are available for avoiding or minimizing the adverse effects of clearing large areas to allow surface mining of bitumen. Minimizing adverse effects may be difficult or impractical in the context of a large mine because it generally requires sterilization of bitumen resources, or it may impose too many constraints that impact the operation of the mine in a safe, efficient, and economical manner. However, the Panel is concerned about the lack of mitigation shown to be effective for the loss of peatlands and believes that without additional mitigation, significant adverse effects will occur.

[656] The Panel is also concerned about the lack of mitigation shown to be effective with respect to species at risk, as wetlands are a biodiversity hotspot for species at risk. Under section 73 of *SARA* there is a requirement to mitigate any effects on species at risk and their habitat. The Panel believes that well-chosen conservation offsets (or allowances) provide a potentially viable mechanism for mitigating the Project's effects on wetlands and species at risk without sterilizing bitumen resources or adversely affecting mine operation. The Panel notes that conservation offsets are the primary means by which Shell proposes to mitigate for adverse project effects on fish habitat under the federal *Fisheries Act*.

[657] The Panel acknowledges Shell's argument that the *LARP* and other regulations and policies of the Government of Alberta do not currently mandate the use of conservation offsets in the oil sands region. However, the use of conservation offsets is contemplated under division 4 of part 3 of *Alberta Land Stewardship Act* (*ALSA*), the biodiversity management framework being developed under *LARP*, and the new wetlands policy being developed by the Government of Alberta. The implementation dates for these initiatives is uncertain, although Alberta has indicated in *LARP* that it will complete the biodiversity management framework by the end of 2013.

[658] The Panel notes that in addition to their use under the *Fisheries Act*, opportunities for the consideration of conservation allowances may arise through other federal processes administered under the *MBCA*, the *SARA*, the *Canadian Wildlife Act* (*CWA*), and *CEAA, 2012* that could allow EC to consider a proposal for conservation allowances as a means of mitigating residual

environmental effects. The Panel is also aware that EC has established an *Operational Framework for Use of Conservation Allowances*.

[659] The Panel recognizes that the use of conservation offsets is a complex issue and the availability, location, effectiveness, and cost of offsets are all matters that need to be considered. In the absence of specific direction from governments on when and where conservation offsets are required, it is not surprising that project proponents are reluctant to commit to the use of them. However, given that there are few options available for avoiding or minimizing the adverse effects resulting from large surface mines, conservation offsets should be considered. The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address the likely significant adverse effects of the Project on wetlands and species at risk. In considering the need for conservation offsets, Alberta and Canada should have regard for their proposed environmental objectives for the Athabasca oil sands region and current and proposed policy framework, including the proposed biodiversity management framework under the *LARP*, Alberta's proposed new wetlands policy, and EC's *Operational Framework for Use of Conservation Allowances*.

[660] The Panel expects Shell to continue researching potential peatland reclamation strategies.

[661] The Panel requires that Shell uses all necessary strategies, including watershed design, landscape contouring, and succession and revegetation planning to ensure the specified areas evolve into wetlands after closure.

[662] The Panel requires Shell to provide a report on the status of all stages of wetland reclamation on Phase 1 and the Project as part of its annual closure and reclamation report. The Panel also requires Shell to report any findings that makes or is aware of related to wetland reclamation research on disturbed oil sands mine sites.

Cumulative Effects

Evidence

[663] According to Shell, wetlands make up the largest portion of land cover types in the RSA (1 015 270 ha, almost 50 per cent). From PIC to application case, Shell said that it estimated that 126 531 ha (12 per cent) of wetlands will be lost or altered in the RSA before reclamation due to direct and indirect effects. Shell estimated that 119 532 ha (12 per cent) of wetlands in the RSA will be lost after reclamation.

[664] Shell predicted that from PIC to PDC, an estimated 185 872 ha (18 per cent) of wetlands will be lost or altered in the RSA before reclamation. Shell also predicted that 123 298 ha (12 per cent) will be lost after reclamation.

[665] Shell said that the effects of cumulative habitat loss on many species at risk and migratory birds in the application case will have a high negative environmental consequence when compared with the PIC. However, Shell maintained that wetlands, including peatlands, will remain abundant in the RSA and wildlife that depend on wetlands will have extensive alternative habitat available. Shell therefore concluded that the Project will not have significant adverse cumulative effects on wetlands or peatlands in the RSA.

[666] EC agreed with Shell that the effects of cumulative habitat loss on many species at risk and migratory birds for the application case and PDC have a high negative environmental consequence when compared with the PIC. EC stated that a number of studies and analyses, including Shell's cumulative effects analysis, have demonstrated high levels of existing and potential future habitat loss and possible adverse effects on species at risk and migratory birds in the region. EC stated that given that reclamation of peatland habitats is not currently possible in the oil sands region, the end result will be permanent habitat loss for species that occupy peatlands. EC indicated that the reclaimed landscape will shift from a lowland-dominated ecosystem before development to an upland-dominated ecosystem after closure, resulting in a shift in the wildlife community.

[667] EC stated that habitat loss has been identified as an important factor contributing to population declines of many species at risk and migratory birds in the oil sands region. EC cautioned that effects on wetland-dependent species such as the yellow rail may be permanent given the limitations in reclaiming peatland habitat. EC stated that given the potential for cumulative habitat loss in the RSA for several species at risk and migratory birds, efforts should be made to implement EC's full suite of mitigations for project effects on wetland habitats, including avoiding, minimizing, and compensating for project effects. Specifically, in the event that proposed measures cannot mitigate direct and indirect habitat loss for species at risk and migratory birds, EC proposed that Shell should consider the use of conservation allowances.

[668] OSEC maintained that the cumulative effects of the Project on northeastern Alberta's air, land, and water systems exceed science-based limits or thresholds causing irreversible harm to the region. In particular, OSEC stated that the Project will result in significant adverse cumulative effects on wetlands. OSEC said that the application case on its own will likely result in unacceptably high, adverse regional cumulative effects on wetlands, and hence should cause the Panel to reject the Project. OSEC also advised that figures given by Shell for reclamation of wetlands in the RSA (12 per cent at closure for the PIC to application case) appeared optimistic given that biodiversity of reclaimed wetlands will not be as high as in the PIC and given that it expected conditions to be drier.

[669] OSEC suggested that even if reclamation succeeds in reducing areal wetland loss, the Panel should proceed with a realistic assumption that the biodiversity value of the landscape will be significantly less given the sensitivity of wetland vegetation to high conductivity and ion concentration of the salt, metals, and naphthenic acids present in the post-mining landscape. OSEC also maintained that loss of wetlands will increase the incidence of forest fires and thereby decrease average forest age. OSEC presented evidence from Rooney et al (2012) that explained that by replacing peatlands primarily with forested uplands, a system will be created that will be dominated by plants that accumulate much less carbon in the soil, thereby reducing carbon sequestration capacity of the ecosystem.

[670] OSEC maintained that if the Project were approved, it was essential that conservation offsets be required to ensure peatland resources are conserved elsewhere. OSEC identified a Wetland – Policy Intent draft released by the Government of Alberta in October 2010 which stated that the policy would promote avoidance of negative impacts on wetlands as the primary and preferred response, minimization of negative impacts on wetlands where avoidance is not possible, and as a last resort and where avoidance and minimization efforts are not feasible or prove ineffective, compensation is required. OSEC proposed that the uncompensated loss of

wetlands in the RSA associated with the application case is at odds with this policy direction and the expectations of Albertans. OSEC stated that it believed that the Project was not in the public interest due to the increased loss of wetlands associated with the Project and the direction of Alberta's draft wetland policy.

[671] ACFN said that the Project was just one of many projects that would lead to the destruction and loss of natural wetlands in the region. ACFN emphasized that boreal wetlands provide critical habitat for many important wildlife species and, consequently, that wetlands in the oil sands region were indelibly linked to the traditional way of life. ACFN expressed particular concern about the effects on fens in the MLWC located on the northeast border of the Project given that First Nations people gather traditional plants in the wetlands for medicinal use. ACFN also stated that the MLWC includes several environmentally significant features, including the McClelland Lake Fen, McClelland Lake, and the McClelland Lake Sinkholes, and that the Project would affect more than 2000 ha of a potential 2500 ha of adjacent fen wetlands. ACFN said that Shell did not propose alternative mitigation to protect the wetland complex despite efforts by other oil sands companies (e.g., FHEC) to reduce dewatering of the lenticular fen. As such, ACFN stated that this Project would produce irreversible, adverse cumulative environmental effects that threaten the ecological integrity of the MLWC.

Analysis and Findings

[672] The Panel acknowledges the evidence that cumulative effects on wetlands at both the application case and PDC scenario could greatly limit available wetland habitat in the RSA. The Panel recognizes that there is no evidence that peatlands can be reclaimed at this time, hence fens and other peatlands will not be reclaimed after closure, resulting in irreversible changes to the ecosystem in the RSA. The Panel acknowledges the position of interested parties that cumulative effects of site clearing and groundwater drawdown of proposed projects will significantly change soil salinity and hydrology, resulting in lowered biodiversity value of the landscape and potential effects on forest fires and forest age. The Panel recognizes that projections of available wetland habitat in the RSA are subject to uncertainty (±20 per cent), making it difficult to rely solely on Shell's predictions.

[673] The Panel notes that the 12 per cent loss of wetlands from the PIC to the application case will remain at 12 per cent after reclamation, indicating no reclamation of these wetlands (i.e., peatlands). The Panel notes that the loss of wetlands from PIC to PDC is 18 per cent, but 12 per cent after reclamation, indicating the potential for some reclamation of certain types of wetlands. The Panel also recognizes that the PDC scenario post-reclamation is a rough estimate of far future conditions.

[674] Of particular concern to the Panel is the loss of the 642-ha rare lenticular patterned fen in the Project footprint, a habitat characterized by a high level of biodiversity and that is found nowhere else in the RSA.

[675] While ACFN raised concerns about effects on the MLWC, the Panel notes that the McClelland Lake Fen will not be affected directly or indirectly by the Project, although it may be affected by other oil sands projects.

[676] The Panel understands that the greatest cumulative effects associated with the loss of wetlands are likely to be loss of wildlife habitat for species at risk and migratory birds that are

wetland dependent (discussed further in the Effects on Wildlife and Their Habitat section). In particular, the Panel notes that the loss of wetland habitat may have considerable effects on the *SARA*-listed yellow rail. According to the *SARA* Management Plan for yellow rail, the main threat is habitat loss from development.

[677] The Panel acknowledges that Shell has said that there is ample wetland habitat in the RSA. However, the Panel is of the opinion that Shell has not shown that the remaining wetland habitat in the RSA will be sufficient for species at risk and migratory birds.

[678] The Panel recognizes the need to mitigate the loss of wetland habitat in the RSA (especially peatlands). The Panel acknowledges the view of interested parties who said that Shell's mitigations for wetland habitat loss are insufficient and that conservation offsets should be considered.

[679] The Panel notes that the Agency's *Cumulative Effects Practitioner's Guide* indicates that regional effects usually cannot be adequately dealt with on a project-by-project review basis. To properly address this type of cumulative effect, the Panel agrees that regional plans are required that clearly establish regional thresholds of change against which the specific actions may be compared. The Panel supports the work of the province in implementing the *LARP* and in developing the proposed *LARP* biodiversity management framework and the wetlands policy as discussed in the Regional Effects section.

[680] The Panel notes that the inability to reclaim peatlands and the lack of measures proposed by Shell that are proven to be effective to mitigate effects on species at risk and migratory birds further exacerbates the issue. In particular, the Panel is concerned about the loss of habitat for wetland-dependent species at risk and migratory birds as a result of both the application case and the PDC scenario.

[681] The Panel notes that compounding the issue is the level of uncertainty (±20 per cent) in the amount of wetlands that will be lost in the RSA as a result of the application case and PDC scenarios. The Panel believes that given the level of uncertainty around remaining wetlands, the many uncertainties associated with potential future development projects and associated reclamation plans, and the degree to which wetlands can be restored to PIC conditions, the precautionary principle would suggest that actions need to be taken to mitigate or avoid the loss of wetlands.

[682] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on wetlands based on the application case and the PDC:

- The loss of wetlands in the RSA is **likely**—the Project footprint (along with numerous other projects) will be cleared resulting in a permanent loss of peatlands given that current evidence suggests that these cannot be reclaimed.
- The magnitude will be **high**—given a loss of peatlands of 126 531 ha and 185 872 ha (1265 km^2 and 1859 km^2) in the application case and PDC, respectively.
- The geographic extent is **regional**—affecting the RSA.

- The duration is **long-term**—given that the timeframe to restore wetlands is more than 80 years and peatland restoration is still not demonstrated for oil sands projects.
- The effects are **largely irreversible**—given that there is no evidence at this time to suggest that peatlands can be reclaimed.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, and is characterized by a wetland-dominant landscape with unique vegetation communities that are particularly sensitive to development (i.e., cannot be reclaimed).

[683] Given the aforementioned points, the overly large size of the RSA, the uncertainty around Shell's predictions, the lack of proposed mitigation measures shown to be effective for the loss of peatlands, the resultant changes to the ecosystem, resulting in a landscape dominated by upland ecosystems, and the cumulative effects on species at risk and migratory birds as discussed in the Effects on Wildlife and Their Habitat section, the Panel finds significant adverse cumulative effects on wetlands (namely peatlands) in the RSA. The Panel notes that although the cumulative losses of 12 and 18 per cent for the application case and PDC, respectively, are below the 20 per cent threshold used by the Panel to determine significance, the Panel emphasizes that had Shell chosen a smaller RSA been chosen or had Shell included the amount of uncertainty around Shell's predictions as discussed in the Methods Used to Assess Effects on Terrestrial Resources section, the amount of wetlands lost would have surpassed 20 per cent in the RSA.

[684] The Panel urges the Government of Alberta to fast track the development of the *LARP* biodiversity management framework and the new Alberta wetlands policy to provide guidance on thresholds for development in the oil sands region that will direct future development of the Project and other developments.

EFFECTS ON OLD-GROWTH FORESTS

Project Effects

Evidence

[685] According to Shell, the total amount of old-growth forest that will be lost in the LSA is 390 ha, approximately 40 per cent of the resource, but only 0.1 per cent of old-growth forest in the RSA. Shell said that given the very small percentage of old-growth to be cleared, the Project's effects on old-growth forests will not be significant.

[686] OSEC stated that virtually the entire LSA will be destroyed during the Project duration, resulting in the nearly complete loss of important vegetation, particularly old-growth forests. OSEC said that Shell has not taken into account the increased susceptibility to forest fires in the post-reclamation landscape, resulting in an underestimation of the loss of old-growth forest potential. OSEC presented a journal article (Rooney et al 2012) that stated that the loss of peatlands will mean a shift to a drier forest, and drier forests are more susceptible to fire, impairing the establishment of old-growth forests.

[687] Shell said that the Project will support the return of old-growth in the future and that the LSA will not necessarily be more prone to forest fires. Shell also said that if the climate becomes

wetter as a result of climate change, the frequency of fire will likely decrease. Shell simulated forest fire risk with model inputs used in the *LARP*, which it said represented the best available knowledge. EC suggested that there is a fair amount of uncertainty about the effects of climate change on precipitation and that it is not known whether the oil sands region will be warmer and wetter, or warmer and drier.

[688] Shell provided mitigations for loss of old-growth forests that are based on forest replanting and reclamation, which it estimated would take 100 or more years. ACFN provided evidence that the vegetation communities that develop in reclamation sites are not comparable to predisturbance communities. It gave an example from the Suncor site that after 20 years, ground-cover composition in reclaimed areas was very different than it was in adjacent forest areas, and native species were not commonly found. ACFN also noted that wildlife use was higher in undisturbed areas than in reclaimed areas and that wildlife such as moose and furbearers did not readily return to reclamation sites. ACFN concluded that in the boreal forest, the similarity between reclamation sites and natural sites in terms of species composition and cover is very low.

[689] OSEC put forward that Shell should be required to develop a biodiversity offset mitigation strategy for old-growth forests at the same ratio that old-growth forests occurred on the landscape before development.

[690] According to Shell, loss of old-growth forest in the LSA will reduce habitat availability for some key old-growth-dependent species at risk such as the Canada warbler (loss of 64 per cent of high-quality and 87 per cent of moderate-quality habitat in the LSA from base case to application case; refer to the Effects on Wildlife and Their Habitat section), but stated that existing old-growth forest in the RSA will provide ample habitat.

[691] EC stated that there has already been high habitat loss for some species, such as Canada warbler, in the RSA, and thus there was no evidence that there would be surplus habitat within the RSA to support the influx of additional birds. EC stated that the success of reclamation and recolonization of reclaimed habitats by species at risk and many migratory birds is uncertain and, for old-growth-dependent species, will take considerable time to achieve. EC said that Shell's post-reclamation upland vegetation community will be dominated by jackpine and black spruce habitats, which have relatively low biodiversity potential (based on Shell's analysis) and support relatively few migratory bird species. As such, EC identified a suite of mitigation measures that will avoid, minimize, and lessen effects of the Project on migratory birds and species at risk; conservation offsets will be an option if other mitigation measures are considered to be ineffective (refer to the Effects on Wildlife and Their Habitat section).

[692] EC, OSEC, and ACFN stated that even if species that rely on old-growth forests were able to recolonize those areas after reclamation, there would be a considerable time lag of essentially 100 years. ACFN described that mature lichen jackpine forests may take 60 years or more to develop, and it did not know how long it would take lichen (a key food for caribou) to develop, or for a blueberry and cranberry understory (for animals and people) to regrow. ACFN concluded that despite the fact that Shell used 80 years as a benchmark for return of old-growth forests, it would take longer than 125 years for old-growth forest to return. OSEC contended that Shell had not provided mitigation for species that rely on habitat in the interim.

Analysis and Findings

[693] The Panel notes that Shell's mitigations for loss of old-growth forests are based on forest replanting and reclamation. The Panel is also aware that interested parties believe that Shell's mitigation measures for the loss of old-growth habitat are insufficient and that conservation offsets, in particular, should be considered. The Panel also recognizes that interested parties have expressed serious concerns about the loss of old-growth forest in the Project area, particularly given the length of time needed for reclamation to occur.

[694] The Panel notes that Shell's mitigation measures have currently not been proven to restore the complexity of old-growth forests and their associated biodiversity. The Panel has further concerns given that the timeframe to reproduce old-growth forest ecosystems in the LSA is over 100 years after closure, which results in a substantial time lag in habitat availability.

[695] The Panel recognizes that old-growth forests provide habitat for a number of species at risk and many migratory birds, and that clearing of the LSA will result in localized habitat loss for many of these species. The Panel notes that EC did not support Shell's assertion that the negative effects of old-growth habitat loss on wildlife would be minimized by old-growth habitat availability in the RSA.

[696] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of project effects on old-growth forests in the LSA:

a) The loss of old-growth forest in the LSA is **likely**—the Project footprint will be cleared and 390 ha of old-growth forest will be removed.

b) The magnitude will be **low**—given the overall size of the area lost (3.9 km^2).

c) The geographic extent is **local**—given the size of the area, although the effects on wildlife that have the LSA as part of their habitat may be regional.

d) The duration is **long-term**—given that the time frame for old-growth forests to return to their former function and biodiversity (at least 100 years) is greater than Shell's 80-year closure timeframe.

e) The effects are potentially **reversible** in the far future. It may be possible to restore biodiversity in the long term (100 years post-reclamation); however, the Panel notes that there is still no evidence in the oil sands region that old-growth forests can be restored to their former biodiversity and complexity.

f) The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, and old-growth forests may be particularly fragile given the time required for restoration. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[697] Given the aforementioned points, the uncertainty of proposed reclamation as mitigation, the time lag to restore old-growth forests to base case conditions, and effects on species at risk and migratory birds described in this report (refer to the Effects on Wildlife and Their Habitat

section), the Panel finds project effects on old-growth forest in the LSA are adverse, but not likely to be significant based on the low magnitude of old-growth forest to be cleared.

[698] While the Panel has determined that the loss of old-growth in the LSA is adverse, but likely not significant, the Panel is concerned about any habitat loss for species at risk and migratory birds that occur in the Project area, many of which prefer old-growth habitat (woodland caribou, common nighthawk, Canada warbler, and black-throated green warbler). The Panel also notes that section 73 of *SARA* requires mitigation of any effects to species at risk.

[699] As discussed more extensively in the Effects on Wetlands section, although *LARP* and other regulations and policies of the Government of Alberta do not currently mandate the use of conservation offsets in the oil sands region, given that few options are available for avoiding or minimizing the adverse effects of large surface mines, the use of conservation offsets may be necessary. The *MBCA*, the *SARA*, the *CWA*, and *CEAA, 2012* all provide opportunities for EC to consider a proposal for conservation allowances as a means of mitigating residual environmental effects.

[700] The Panel believes that its recommendation that the Governments of Canada and Alberta consider conservation offsets to help mitigate project effects on wetlands would also be appropriate for helping to mitigate project effects on old-growth forests if Alberta or Canada believed that additional mitigation for effects to old-growth-dependant species at risk and migratory birds was necessary.

[701] The Panel notes that Shell will be subject to guidelines set out in the future *LARP* biodiversity management framework. The Panel recommends that the Government of Alberta work toward timely completion of the *LARP* biodiversity management framework and that it include thresholds for old-growth forest loss to guide the development of future oil sands projects.

Cumulative Effects

Evidence

[702] Shell estimated old-growth forest potential in the RSA at 356 582 ha in the PIC decreasing by 60 242 ha (17 per cent of resource in the RSA) in the application case. Shell predicted an additional loss of 22 061 ha of old-growth forest in the RSA from application case to PDC (total decrease of 23 per cent).

[703] OSEC stated that the application case on its own would likely result in unacceptably high adverse cumulative effects on old-growth forests in the RSA. OSEC also indicated that the significant adverse effects are further increased in the PDC.

[704] Shell's EIA predicted that a loss of old-growth boreal forest will reduce habitat required by old-growth specialist species at risk, including Canada warbler (loss of 61 per cent high quality habitat from PDC to PIC), woodland caribou (loss of 93 per cent moderate quality habitat from PDC to PIC), and many other boreal migratory birds. OSEC maintained that this loss of old-growth forest will exacerbate the already significant regionally adverse effects on the Canada warbler.

[705] Shell simulated forest fire risk in the RSA based on a model used for the *LARP*, which Shell believed provided the best available knowledge. ACFN claimed that Shell may have used the wrong temporal scale in its predictions for the fire cycle in the RSA (80 years) given that recent evidence from pollen records suggests that the regional mean fire interval may be as little as 34 years. As a result, ACFN contended that Shell may have overestimated the amount of old-growth currently in the RSA.

[706] OSEC indicated that Shell had underestimated the loss of old-growth forest potential in the RSA because it had not taken into account the increased susceptibility to fire in the post-reclamation landscape. OSEC presented evidence that groundwater drawdown and loss of peatlands in the RSA will create a drier ecosystem that is more vulnerable to forest fires and indicated that Shell did not consider this additional risk in its assessment. EC agreed that the RSA may be at a greater risk of forest fires. OSEC maintained that the Panel should not approve the Project because of significant adverse cumulative effects on old-growth forest both directly from clearing of the Project footprint and indirectly through an increase in forest fires resulting from the loss of wetlands and a drier climate.

[707] Shell responded that the 80-year fire cycle it used was a conservative average fire cycle intended to account for a wide range of possible old-growth forest amounts within a natural range of variation in the Alberta-Pacific Forest Industries Inc. forest management area. Shell further argued that some global climate change models predicted that the climate for this region will be warmer and wetter in the future, thereby negating any increased forest fire risk.

[708] EC suggested that there was inherent uncertainty in climate models and that it was difficult to predict with confidence that a wetter environment will prevail, particularly in the summer months.

Analysis and Findings

[709] The Panel understands that projections of available old-growth habitat in the RSA are subject to a degree of uncertainty given the use of Landsat imagery as discussed in the Methods Used to Assess Effects on Terrestrial Resources section. The Panel is also aware that Shell did not take into account the increased risk of forest fires resulting from a drier upland landscape in its habitat modelling. The Panel acknowledges that changes in the hydrology of the region as a result of reclamation and climate change may affect the risk of forest fires, thereby increasing the uncertainty in Shell's predictions of old-growth habitat available in the RSA.

[710] The Panel notes that Shell predicted old-growth forest would decrease by 17 per cent in the RSA from the PIC to the application case. The Panel believes that although the effects of clearing of old-growth forest are theoretically reversible through carefully managed reclamation, there is currently no evidence in the oil sands region that the complexity and biodiversity of old-growth forests can be restored to preindustrial conditions. The Panel further recognizes that the extended time lag for reclamation of old-growth forests may preclude recolonization by preindustrial flora and fauna as some of the species that are currently declining may be extirpated before habitat can be restored.

[711] The Panel recognizes that old-growth forest habitat has high biodiversity value and that the loss of this habitat in the RSA will negatively affect wildlife that are old-growth forest specialists, many of which are species at risk (e.g., Canada warbler and woodland caribou). The

Panel recognizes that unproven mitigation measures for alleviating effects on old-growth forests and the species at risk and migratory birds that inhabit them exacerbates the issue, as does the time lag to recovery. The Panel acknowledges that there are not many options for mitigating old-growth forest loss to oil sands mine developments that do not entail the sterilization of bitumen.

[712] The Panel notes that Shell's EIA is one of the few EIAs in the oil sands region that has incorporated the effects of natural disturbance (i.e., fire).

[713] The Panel believes that a precautionary approach to the determination of significance of effects would be to consider Shell's predicted old-growth forest availability in the RSA as a very rough guide to what might actually be available, while understanding that the amount of habitat lost could be greater than that predicted by Shell.

[714] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on loss of old-growth forest based on the application case and the PDC:

a) The loss of old-growth forest in the RSA is **likely**—the Project footprint (along with numerous other projects) will be cleared, resulting in a loss of old-growth forest habitat.

b) The magnitude will be **high**—given that losses of old-growth forest will be in the tens of thousands of ha (e.g., loss of 60 242 ha and 82 303 ha in the application case and PDC, respectively).

c) The geographic extent is **regional**—affecting old-growth in the RSA.

d) The duration is **long-term**—given that the timeframe to restore old-growth forest is more than 100 years.

e) The effects are **potentially reversible** in the long term. There is currently no evidence to show that old-growth forests can be restored to preindustrial levels of complexity and biodiversity in the oil sands region in the timeframe of the Project (40 years of operations plus 100 years). Furthermore, some species that rely on old-growth habitat are already declining to extirpation (e.g., woodland caribou).

f) The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities and as such, old-growth forest has already been affected in the oil sands region (e.g., Shell reports a 16 per cent loss of old-growth in the RSA at the base case [57 009 ha]).

[715] Given this analysis and recognizing the uncertainty regarding the effectiveness of proposed mitigation measures, the overly large size of the RSA, the amount of uncertainty in Shell's predictions, and the effects on species at risk and migratory birds that are old-growth specialists, many of which are already at risk, the Panel finds significant adverse cumulative effects on old-growth forest in the RSA as a result of the application case and the PDC when compared with the PIC. Although the percentage of old-growth lost is predicted to be less than 20 per cent for the application case, the Panel emphasizes that had Shell chosen a smaller RSA or had Shell included the amount of uncertainty in Shell's predictions, the amount of old-growth

forest that would be lost would likely have surpassed 20 per cent in the RSA. The Panel further notes a loss of 23 per cent is predicted for the PDC, which surpasses the 20 per cent threshold.

[716] Given the cumulative adverse effects predicted for old-growth forests in the RSA under the application case and PDC and the importance of old-growth forest for some species at risk, the Panel urges Alberta to complete and implement the proposed biodiversity management framework under *LARP* as soon as possible. The Panel recommends to the Government of Alberta that to the extent possible the biodiversity management framework should provide clear direction on the management objectives for old-growth forests in the Lower Athabasca planning region, identify acceptable levels of disturbance (thresholds) for different areas of the region that reflect the permitted land uses and management objectives for those areas, and provide specific direction on the role of conservation offsets within the planning region.

[717] The Panel's recommendation regarding the consideration of the need for conservation offsets by Canada and Alberta as discussed in other sections of this report would also help mitigate effects on old-growth forests. The effects on old-growth forests should be considered in any determination of offsets.

[718] The Panel recommends that the Governments of Canada and Alberta ensure that the best available research and development is used to improve reclamation of old-growth forest habitat in the oil sands region in order to provide this habitat as soon as possible.

EFFECTS ON TRADITIONAL PLANT POTENTIAL AREAS

Project Effects

Evidence

[719] Shell stated that it relied on several studies from past projects and on TLU studies that were available in 2007 to identify traditional plants used in the oil sands region. Shell explained that it drew from these reports a list of the relevant species in the oil sands region and determined their uses and use ranking. Shell explained that most of the information in these reports was relevant to Fort McKay, and it assumed that other Aboriginal groups had similar uses.

[720] Shell stated that it had not completed any field surveys specifically to locate and document the abundance and distribution of traditional plant species within the LSA. Shell stated that it did record occurrences of traditional plants when noted in the field.

[721] Shell stated that it established a traditional plant species score for the high-, moderate-, and low-ranked ecosite phases and wetland types within the LSA and RSA using the list of traditional plants and their abundance in each ecosite phase and wetland type. Shell provided maps of the high, moderate, and low traditional plant potential in the LSA and RSA. Shell explained that it obtained the ecosite phases and wetland types from the AVI for the LSA and from remote sensing/Landsat in the RSA. Shell explained that it did not assess the effects of the Project on the abundance of traditional plants directly but assessed the effects of the Project on areas that had the potential to support traditional plants.

[722] Shell stated that during construction and operations, the Project will alter 4584 ha (77 per cent) of the high traditional use plant potential in the LSA, which will have a negative, moderate environmental consequence. It said that the Project will also alter 8481 ha (92 per cent) of the moderate traditional plant potential and 10 129 ha (70 per cent) of the low traditional use plant potential.

[723] Shell stated that in the RSA, due to direct and indirect effects, the Project will alter 5749 ha of the high traditional plant potential, 9623 ha of the moderate traditional plant potential, and 10 591 ha of the low traditional plant potential. Shell noted that the amount of disturbance associated with each category of traditional plant potential represented less than 1 per cent of the RSA. Shell determined that because less than 1 per cent of the high and medium rare plant potential in the RSA would be affected by the Project, the effects were not significant. The Panel refers the reader to the Effects on Biodiversity section for more information.

[724] At closure, from the base case to the application case in the LSA, Shell predicted that the high traditional use plant potential areas would decrease by 7 per cent (424 ha) and the moderate traditional use plant potential areas by 52 per cent (4733 ha). Shell stated that the low traditional use plant potential areas will increase by 36 per cent. Shell indicated that its evaluation of residual disturbance takes into consideration reclamation measures.

[725] Shell indicated that when possible, the terrestrial portion of the land will be reclaimed by direct placement of subsoil and topsoil on a newly-prepared landscape. Shell stated that after the seeds in the topsoil have germinated and established, more trees and shrubs may be planted in order to achieve the ecosites described in Shell's reclamation and closure plan. The Panel refers the reader to the Reclamation section for more information.

[726] Shell indicated that it designed its planting prescriptions for reclamation to provide a range of ecosite phases that should support a variety of traditional land end uses. Shell indicated that the planting prescriptions included species that are highly used by First Nations, such as blueberry, cranberry, rose, bearberry, white spruce, black spruce, and poplar. Shell planned to use other species in the planting prescriptions to provide habitat for wildlife species identified in traditional ecological knowledge (TEK) and TLU studies.

[727] ACFN stated that the number of plant species that the revised reclamation guidelines (CEMA 2009) recommended to indicate revegetation success was two orders of magnitude fewer than the number of plant species currently found in the LSA. ACFN expressed concern that, as a consequence, far fewer traditional plants will be in reclamation sites than will be found in native ecosites. ACFN said that it was also concerned that wetlands will be replaced by uplands with lower biodiversity.

[728] ACFN stated that fewer plants will be in Shell's reclamation sites than currently exist and that Shell did not provide information on how it intends to re-establish the predisturbance diversity of plant species or how it will enhance diversity in areas where direct soil placement is not possible. ACFN stated that with few exceptions, there was no ingress of species from adjacent native forests onto reclamation sites and there was a risk that invasive species may colonize the reclaimed area.

[729] ACFN produced evidence of gathering for subsistence and medicinal use in the LSA and stated that these gathering activities will be directly affected by the Project.

[730] The NSFMFM stated that it gathers a variety of plants in the Project area, including blueberries and low-bush cranberries. The NSFMFM and Clearwater Band also had concerns about the potential loss in the Project area of a fungus that grows on the diamond willow. It said that the fungus is considered sacred and used for ceremonial purposes.

[731] FMMFN #468 had concerns about certain plant species that would be potentially affected by the Project, including a wide selection of berries and traditional medicines such as roots, bark, and sweetgrass.

[732] Some Aboriginal groups stated that the areas south of McClelland Lake and around Kearl Lake are unique because they supply some valued plants for food and medicinal uses and are easy to access.

[733] ACFN stated that Aboriginal people gather traditional plants in the wetlands for medicinal and subsistence uses and are concerned that the wetlands, including the muskeg, cannot be reclaimed.

Analysis and Findings

[734] The Panel notes that Shell assessed the effects of the Project on traditional plant potential, not on the abundance of traditional plants that are found and used in the Project area. Shell did not conduct any specific field surveys on the distribution and abundance of traditional plants in the LSA and when it recorded occurrences, it did not include these in the EIA. The Panel finds that it is unclear what species and abundance of traditional plants occur in the LSA.

[735] The Panel notes that most of the high and moderate traditional plant potential in the LSA will be lost during the construction and operation phase of the Project, and that after closure and reclamation the high and moderate traditional use plant potential will decrease in the LSA by 7 and 52 per cent, respectively.

[736] The Panel notes that the Aboriginal groups currently gather a variety of traditional plants in the LSA for subsistence, medicinal, and spiritual purposes. The Panel notes that the Project footprint shares borders with several other large mines and that none of these areas will be available for harvesting of traditional plants for many years. As a consequence, the Aboriginal people currently using the area would be affected because the traditional plants will not be available in the Project area or in its vicinity and they would therefore have to travel further to find equivalent resources. The Panel notes that most Project reclamation will take place between 2045 and 2060, and it will take years to decades after closure to re-establishment traditional plants. The loss for several decades of areas used for traditional plant harvesting has implications for the transfer of traditional knowledge between generations.

[737] The Panel acknowledges that some wetlands, including peatland, will not be reclaimed and that several traditional plants are strongly associated with these wetlands. The Panel therefore concludes that the reclaimed LSA is unlikely to provide the quantity and diversity of traditional plants that currently exists.

[738] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of effects on traditional plant potential areas:

- The loss of traditional plants in the LSA is **likely**—the Project footprint will be cleared.
- The magnitude will be **major**—given that Shell predicted that 4584 ha, 8481 ha, and 10 129 ha of the high, moderate, and low traditional plant potential areas, respectively, will be lost during the operation of the mine.
- The geographic extent is **local**—given the size of the LSA.
- The duration is **long-term**—most of the reclamation for the Project will take place between 2045 and 2060, and it will take years to decades for some species of traditional plants to re-establish after closure.
- Some effects may be **irreversible**—given that wetlands provide for several species of traditional plants and many wetlands cannot be reclaimed; the reclaimed areas will likely be of lower biodiversity compared with the baseline or PIC; assuming successful reclamation, the high and moderate traditional use plant potential will still decrease in the LSA by 7 and 52 per cent, respectively, compared with the base case.

[739] In its evaluation of significance, the Panel has taken into consideration that the Project footprint shares borders or is close to several other large mines and that none of these areas will be available for harvesting traditional plants for many years and, as a consequence, the Aboriginal persons gathering plants in the area would have to travel further to find equivalent resources.

[740] The Panel notes that wetlands are generally considered areas of moderate traditional plant potential and that 52 per cent of the moderate plant potential after reclamation arises is lost because of the difficulty reclaiming wetlands. The Panel has also taken into consideration the greater proportion of upland in the reclaimed footprint and that several plants of interest to Aboriginal people are strongly associated with wetlands.

[741] Given the aforementioned points, the fact that a significant portion of quality traditional plant potential areas in the LSA will be lost for several generations and that the reclamation process will reinstate less than 50 per cent of the areas of moderate plant potential, the Panel finds that the Project will have significant adverse effects on traditional plant potential.

[742] The Panel recommends that before reclaiming any portion of the disturbed area, the Governments of Canada and Alberta ensure that Shell produce, in collaboration with the Aboriginal groups, a reclamation plan with the goal of optimizing the number and quality of traditional plants as well as the species distribution.

[743] The Panel recommends that before construction, the Governments of Canada and Alberta ensure that Shell provides interested Aboriginal groups with full access to the Project lands to allow any valued traditional plants to be collected.

Cumulative effects

Evidence

[744] Shell stated that in the base case, 23 per cent (126 817 ha) of the high and 9 per cent (107 410 ha) of the moderate traditional plant potential areas within the RSA have already been

lost compared with the PIC. Shell further explained that in the application case, 24 per cent (132 567 ha) of the high and 10 per cent (117 033 ha) of the moderate traditional plant potential areas within the RSA will be disturbed, and after closure and reclamation there will be a loss of 23 per cent (128 270 ha) of the high and 9 per cent (105 879 ha) of the moderate traditional plant potential within the RSA.

[745] Shell predicted that there will be a loss of 32 per cent (176 716 ha) of the high and 14 per cent of the moderate (170 205) traditional plant potential areas in the RSA for the PDC compared with the PIC.

[746] Shell predicted that in the far future, by 2165, high traditional use plant potential habitat will increase in the RSA by 1 per cent over the PIC and moderate traditional use plant potential will decrease by 6 per cent. Shell explained that the predicted increase in high traditional use plant potential is a result of nontreed wetland reclamation and natural wetland regeneration.

[747] Shell provided information on the effects of the Project on culturally significant ecosystems as defined and used by Fort McKay. Shell stated that areas of low, moderate, and intense use for traditional plant harvesting in the culturally significant ecosystems experienced an increase in disturbance of 321 280 ha (23 per cent), 122 586 ha (31 per cent), and 35 268 ha (47 per cent), respectively, from the PIC to the base case.

[748] Shell stated that in the application case, areas of low, moderate, and intense use for traditional plant harvesting in Fort McKay's culturally sensitive ecosystems would experience disturbance levels of 330 620 ha (24 per cent), 135 286 ha (34 per cent), and 35 268 ha (47 per cent), respectively. Shell also stated that disturbance in the low, moderate, and intense use areas would be of 391 989 ha (28 per cent), 168 537 ha (42 per cent), and 41 498 ha (55 per cent), respectively, from the PIC to the PDC.

[749] Fort McKay stated that Shell's traditional plant potential ranking system criteria may not coincide with the experiences of community members harvesting traditional plants and thus may not accurately describe the values of some areas. For example, Fort McKay stated that plants that have low frequency and percentage cover in the landscape may be of significant value to the community and get a low traditional use potential ranking despite their high significance to the community.

[750] Fort McKay selected a forty township study area (FTSA) approximately centred on the hamlet of Fort McKay to assess the effects of both PRM and the Project as well as the cumulative effects of the oil sands development. Fort McKay uses the FTSA as a regional-scale study area in its *Fort McKay Specific Assessment*. Fort McKay explained that Shell's LSA for both PRM and the Project represents about 13.3 per cent of the land within the FTSA.

[751] Fort McKay stated that seven traditional use berry sites will be lost because of the Project and other planned developments. Fort McKay explained that the loss of 62 berry-producing sites in the FTSA represents a cumulative loss of 54 per cent of the total sites since pre-development.

[752] Fort McKay expressed concern that disturbance of wetlands within the FTSA will affect the availability of traditional-use species or groups of plants usually found in wetlands. Fort McKay stated that about 18 per cent of the wetlands in the FTSA in the base case will be lost in the PDC and an additional 14 per cent of the uplands will be disturbed. Fort McKay stated that

the cumulative effects of all projects developed since the late 1990s and of the Project and other planned developments results in about a 40 per cent decrease in the area occupied by wetlands available for the gathering of traditional use plants that are strongly associated with wetlands.

[753] All of the Aboriginal groups expressed concern that the quality and quantity of traditional plants were declining in the oil sands region and in the Project area because of the existing cumulative effects of oil sands related development. All of the Aboriginal groups stated that they were concerned about contamination of traditional plants and that these concerns result in avoidance of use. They stated that the Project will add to the existing adverse cumulative effects on traditional plants. These concerns are discussed more fully in the Effects on Aboriginal Traditional Land Use, Rights, and Culture section.

Analysis and Findings

[754] The Panel notes that according to Shell's assessment, 23 and 9 per cent of the high and moderate traditional plant potential, respectively, is already lost in the RSA in the base case. The Panel further notes that Shell predicted losses of 24 per cent and 10 per cent for high and moderate traditional plant potential, respectively, in the RSA for the application case and losses of 32 and 14 per cent in the high and moderate traditional plant potential areas, respectively, in the RSA for the PDC.

[755] The Panel notes that in the far future, according to Shell, the high traditional plant potential areas will increase by 1 per cent in the RSA over the PIC while moderate plant potential will decrease by 6 per cent. The Panel notes that these predictions are based on the assumption that the wetlands will be successfully reclaimed and equivalent land capability will be restored. The Panel believes that Shell may have overestimated the potential area in the RSA that can be reclaimed to land capability equivalent to preindustrial conditions, particularly given that the methods for reclaiming peatlands are unproven and the substantial time lags for reclaiming old-growth forests. The Panel believes that Shell did not provide a sound rationale for its prediction of traditional plant potential in the far future given that the success of oil sands operators in reclaiming traditional plants is unknown.

[756] The Panel notes that according to Shell the low-, moderate-, and high-use culturally sensitive ecosystems for traditional plants identified by Fort McKay were already disturbed by 23, 31, and 47 per cent, respectively, in the base case. The Panel believes this indicates that oil sands related developments in combination with other activities such as forestry and forest fires have already resulted in adverse effects of high magnitude within these areas of traditional plant gathering. The Panel further notes that Shell stated that the losses of low-, moderate-, and high-use culturally sensitive ecosystems for traditional plants in these areas would be of 24, 34, and 47 per cent from the PIC to the application case and 28, 42, and 55 per cent from the PIC to the PDC. The Panel believes this level of disturbance is significant and notes that the areas most affected are the areas of high traditional use.

[757] Based on the criteria in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of effects on traditional plant potential:

- The loss of traditional plant potential areas in the RSA is **likely.**

- The magnitude will be **major**—there have already been significant losses of high and moderate traditional plant potential areas in the RSA, and additional losses are predicted in the application case and PDC compared with the PIC.
- The geographic extent is **regional**—given that the effects occur in the RSA.
- The duration is **long-term**—most reclamation for the Project will take place between 2045 and 2060, and it will take years to decades after closure to re-establish some traditional plants.
- Some effects may be **irreversible**—given that wetlands provide for several species of traditional plants and many wetlands cannot be reclaimed; the reclaimed areas will likely be of lower biodiversity compared with the base case or PIC. The Panel notes that Shell indicated that after closure and reclamation there will still be a loss of 23 per cent of high and 9 per cent of moderate traditional plant potential for the application case. The Panel also notes that long after closure and reclamation, the irreversible effects on traditional plant potential areas in the LSA will continue to contribute to the adverse cumulative effects on traditional plant potential areas at the regional scale.

[758] The Panel notes that in the base case, the culturally significant ecosystems for traditional plants and the areas of high and moderate traditional plant potential in the RSA are already disturbed, and that according to Shell, the application case has a relatively small contribution to the overall disturbance. The Panel notes that the percentage of disturbance does not change significantly in the application case, suggesting that the incremental loss of traditional plants caused by the Project is small at a regional scale. However, the Panel notes that the large size of the RSA compared with the footprint of the Project helps limit the percentage of losses at a regional scale. The Panel further notes that the predictions for the PDC further add to the overall disturbance in the RSA and believes that the incremental effects that result from each project in the RSA can add up to significant adverse cumulative effects at the regional scale.

[759] The Panel believes that given the significant amounts of disturbance predicted for areas of high and moderate traditional plant potential, the long time lag between disturbance and reclamation, and the uncertainty associated with wetlands reclamation, the cumulative effects on traditional plants in the RSA will be adverse and significant. More discussion on how this affects traditional land use is in the Effects on Aboriginal Traditional Land Use, Rights, and Culture section.

[760] The Panel recommends that the Government of Alberta consider the need to identify and protect areas of significant traditional plant potential as part of the development of the biodiversity management framework under *LARP*. The Panel recommends that the Government of Alberta involve Aboriginal groups in the development of the *LARP* biodiversity management framework, particularly sections that are relevant to the protection of traditional plants.

[761] The Panel recommends that if conservation offsets are required by the Governments of Alberta and Canada to mitigate project effects to wetlands or old-growth forests, that Alberta and Canada also consider involving Aboriginal groups in site selection to ensure, where feasible, these areas are also accessible and appropriate for the gathering of valued traditional plants.

EFFECTS ON WILDLIFE AND THEIR HABITAT

General

Project Effects

Evidence

[762] Shell arrived at conclusions about significance to wildlife species using professional judgment based on the analysis of effects on abundance, habitat, and movement of all species at risk and KIRs. Shell concluded that the overall effects of the Project on wildlife are not likely to be significant.

[763] Shell predicted that activities associated with direct mortality due to site clearing for the Project would have a negligible environmental consequence for all wildlife species at risk during operations. Shell also stated that direct mortality due to site clearing was well understood but lacked quantification, thus it rated confidence in this prediction as moderate.

[764] Shell suggested that the magnitude of the effects of the Project on overall wildlife abundance will be negligible on the LSA scale after reclamation.

[765] Shell said that during construction and operation the Project will have negative and negligible effects on wildlife movement at the LSA and RSA scales, ranging from negligible for avian species to high for terrestrial mammals. It expected wildlife movement around the Project footprint to be sufficient to maintain genetic connectivity in the RSA. It maintained that this will be verified through monitoring of presence, relative abundance, and distribution of wildlife in the Project area, and through Shell's involvement in regional monitoring initiatives, such as the Wildlife Habitat Effectiveness and Corridor Program Technical Committee under the CONRAD.

[766] ACFN was concerned that the Project was going to remove a known and regionally valuable wildlife movement corridor along the Muskeg River and that mitigations to protect that corridor will be ineffective. ACFN was also concerned that Shell had not provided evidence that genetic connectivity will be ensured in the Project area. OSEC said that existing fragmentation of habitat in the RSA from oil and gas exploration will contribute to overall ineffectiveness of movement corridors.

[767] Shell stated that the environmental consequences of wildlife habitat loss during construction and operations were high at the LSA scale for all affected species and that it also expected the Project to result in indirect habitat loss through sensory disturbance and surficial aquifer drawdown. Shell reported that all KIRs and species at risk had more than 60 per cent high-quality habitat loss during construction and operations (refer to appendices 10a and 10b for complete list of KIRs and species at risk).

[768] Shell predicted substantial habitat loss for several species at risk that rely on old-growth and wetland habitats in the LSA. Consequently, Shell concluded that habitat loss as a result of the Project will have a high environmental consequence for several species that rely on these habitats (e.g., yellow rail, horned grebe, rusty blackbird, and Canada warbler). However, Shell also asserted that the best available information suggests that abundance of these species is not limited by habitat in northeast Alberta. EC did not dispute Shell's conclusion that the Project is

unlikely to cause a significant adverse effect on habitat availability for species at risk and the black-throated green warbler at the scale of the RSA but expressed concern about Shell's use of the RSA to determine significance of project effects given the size of the RSA (refer to the Methods Used to Assess Effects on Terrestrial Resources section). EC also said that the effectiveness of using remaining habitat in the RSA to alleviate the effects of the loss of LSA habitat was uncertain and cumulative effects from other proposed projects reduce this availability even further.

[769] Shell said that its main mitigation measure for wildlife habitat loss, including species at risk and migratory birds, was habitat reclamation. According to Shell's predictions, 8 out of 10 KIRs and species at risk (common nighthawk, horned grebe, olive-sided flycatcher, rusty blackbird, short-eared owl, western toad, wood bison, and yellow rail) had high or moderate habitat loss of more than 20 per cent in the LSA after reclamation. However, Shell argued that habitat loss from the Project is not likely to affect the viability of the regional populations of any wildlife species after reclamation. Shell also said that some species (e.g., black bear, Canada lynx, beaver, and the Canada warbler), will benefit from the large increases in productive forests and associated terrestrial uplands that develop after reclamation.

[770] Interested parties said that using reclamation of LSA lands as a mitigation measure for wildlife habitat loss was insufficient, particularly for wetlands and old-growth forests. According to OSEC, the best reclaimed wetlands on process-affected oil sands mining sites are salt marshes that are low in species biodiversity compared with the prevailing pre-disturbance freshwater peat wetlands. ACFN stated that Shell's claims about the return of wildlife to a reclaimed area must be supported by data that demonstrate that this has occurred elsewhere, and any claim of a successful re-establishment of habitat and return of wildlife must be tested in the future. ACFN further stated that reclamation will not lead to the return of the wildlife KIRs within less than 20 years as stated by Shell, resulting in long-term duration of the impact.

[771] EC recognized that there are limited opportunities to directly avoid effects on species at risk and migratory bird habitat in the Project area given the location of oil sands deposits. As such, it recommended additional mitigation and suggested that for components of the Project not within the mineable footprint (e.g., the Redclay Compensation Lake and Kearl Lake levee), Shell should evaluate all options to avoid or minimize effects on species at risk and migratory bird habitat.

[772] EC said that Shell had identified residual (i.e., post-mitigation) effects that have high negative environmental consequence at the local scale for several species at closure, including species at risk and migratory birds. EC recommended that these local-scale effects be mitigated, based in part on the requirements of s.79(2) of *SARA*, which states that if a project is carried out, measures must be taken to avoid or lessen adverse effects on species at risk and to monitor them. EC referenced the guide prepared by EC and Parks Canada, *Addressing Species at Risk Act Considerations Under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada* (2010), which describes that the obligation to identify and mitigate adverse effects on listed wildlife species is independent of the likely significance of the adverse effects.

[773] EC recommended a systematic, rigorous, and hierarchal approach to mitigation that first considers avoidance of effects, followed by minimization of effects and lastly, when all other

measures have been implemented, restitution or compensation for any residual adverse effects (e.g., via habitat offsets). EC recommended that conservation offsets be selected according to its *Operational Framework for Use of Conservation Allowances*.

[774] OSEC and Aboriginal groups said that Shell should consider habitat offsets to mitigate project effects on wildlife habitat (see the Effects on Wetlands section for further discussion). OSEC stated that the Panel should require Shell to develop and submit a verifiable mitigation strategy for compensatory offsite offsets in order to achieve a net positive impact on habitat for species at risk and other valued wildlife species.

[775] Shell did not agree that compensatory off-site mitigation was required in order to achieve a net positive impact for species at risk and valued wildlife given that it had predicted no significant adverse effects on species at risk or wildlife KIRs as a result of the Project.

[776] Shell stated that it was conservative in its determination of significance given that it used 20 per cent habitat loss as an indicator of high-magnitude habitat loss while other studies reported thresholds that were much higher (up to 70 to 90 per cent). However, Shell stated that even if a species had 20 per cent habitat loss, this did not necessarily mean there would be a significant adverse effect. Shell indicated that it evaluated significance based on professional judgment and on information on the species at a regional or larger scale.

[777] OSEC contended that Shell should have used the threshold for habitat loss provided in the *TEMF*, which recommends that management triggers be set at 10 per cent below the NRV, and that a 20 per cent decline in habitat for any one species is a threshold that should equal a significant adverse impact. OSEC also referred to *ERCB Decision 2011-005*, which concluded, "For species at risk, the Panel is of the view that any net harm (negative impact) to an individual of the species, its residence, or its critical habitat would constitute a significant adverse effect."

[778] EC said that a 70 to 90 per cent threshold of habitat loss was not precautionary, and that thresholds can vary depending on several factors, including the species in question and the study area. EC also stated that there was much uncertainty around thresholds and that habitat loss in the range of 20 to 40 per cent can be enough to change a population trajectory.

Analysis and Findings

[779] The Panel has not been able to rely on Shell's determination of significant project effects on wildlife given the issues raised surrounding Shell's methods for estimating habitat availability (see the Methods Used to Assess Effects on Terrestrial Resources section).

[780] The Panel notes that Shell did not use any of the thresholds available in its determination of significance of effects (e.g., *TEMF* or *ERCB Decision 2011-005*). The Panel notes that if Shell had used the 20 per cent habitat loss threshold, it would have concluded that 7 out of 10 species demonstrated significant adverse project effects as a result of habitat loss in the LSA.

[781] The Panel is aware that wildlife habitat loss appears to be one of the most important issues for interested parties, and that there is considerable concern over loss of species at risk and migratory bird habitat. The Panel understands that Aboriginal groups have particular interest in effects on culturally important species, such as moose, caribou, bison, and waterfowl.

[782] The Panel is of the opinion that the greatest threat to species at risk as a result of the Project is the loss of habitat, particularly for wetland dependent species. The Panel notes the mitigation measures proposed by Shell may not be adequate, and the inability to reclaim wetland habitat to its former ecosystem function further exacerbates the issue. Particularly concerning to the Panel is the loss of habitat for species at risk and migratory birds, in some cases at levels greater than established thresholds. The Panel notes that the obligation to identify and mitigate adverse effects on listed wildlife species under *SARA* is independent of the likely significance of the adverse effects. The Panel is aware that the joint review panel in *ERCB Decision 2011-005* determined that any effects on species at risk were significant. The Panel is of the opinion that Shell has not provided sufficient mitigation measures for species at risk or migratory birds that depend on wetlands.

[783] The Panel understands that Shell has relied on habitat availability in the RSA and on reclamation within the LSA to alleviate and/or mitigate the effects of wildlife habitat loss. The Panel finds that Shell's reliance on reclamation is unfounded, particularly in the case of peatlands. The Panel also finds that Shell has provided no evidence to suggest that the RSA can provide ample habitat and is below carrying capacity for most species. The Panel notes that Shell has not indicated how it will mitigate effects on peatland dependent species like the yellow rail.

[784] The Panel notes that Shell determined that project effects to wildlife movement would be high and negative for terrestrial mammals during construction and operation but that it indicated that wildlife movement around the Project footprint would be sufficient to maintain genetic connectivity in the RSA. The Panel notes that Shell has proposed to monitor to ensure that that this is the case and is satisfied with this approach.

[785] Based on the criteria in the Agency's guide, *Determining whether a project is likely to cause significant environmental effects* (November 1994), the Panel used the following approach to determine the significance of project effects on wildlife in the LSA:

- The loss of wildlife habitat in the LSA is **likely**—the Project footprint will be cleared, and Shell predicts habitat loss more than 20 per cent for 7 out of 10 species at risk and KIRs after reclamation.
- The magnitude will be **high**—given that over 10 000 ha of wetlands will be cleared and 85 per cent of this area is peatlands, which cannot be reclaimed.
- The geographic extent is **regional**—given that many of the species that will be affected have home ranges that are only partially within the LSA, and given that the area immediately adjacent to the Project consists of other approved oil sands mines (e.g., MRM, Syncrude Aurora North, and KOSP). Hence, loss of habitat in their range may affect species viability on a regional level.
- The duration is **long-term**—given that peatland restoration is still not demonstrated for oil sands projects. Likewise, the ability of some species to rebound after closure will be strongly linked to characteristics of their life history.
- The effects are **largely irreversible**—given that there is still no evidence that peatlands can be successfully reclaimed, and peatlands constitute 85 per cent of wetland habitat being lost upon which many species at risk and migratory birds depend. Likewise, the loss of many

species, depending upon their life history characteristics, may be irreversible, given that some species are at risk or may be are already declining to extirpation.

- The ecological context of the oil sands region, the area within which the Project would take place, has already been adversely affected by human activities and some habitats may be particularly fragile given their inability to be reclaimed. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[786] Given this analysis and the lack of proposed mitigation measures that have been shown to be effective, the inability to reclaim certain habitats to PIC or base case conditions, and effects on species at risk and migratory birds, the Panel finds significant adverse project effects on wetland-reliant species at risk and migratory birds and their habitat in the LSA.

[787] The Panel is concerned about the lack of mitigation shown to be effective proposed for loss of wildlife habitat in the LSA, particularly for wetland habitat used by species at risk and migratory birds. The Panel believes that without additional mitigation, significant adverse effects will occur.

[788] As discussed in the Effects on Wetlands section, the Panel recommends that, before other provincial and federal approvals are issued, the Governments of Canada and Alberta consider the need for conservation offsets to further mitigate project effects. The potential use of conservation offsets should include a consideration of the need to compensate for project effects to wetland-reliant species at risk and migratory birds that are wetland-reliant or species at risk.

[789] The Panel notes that Shell will be subject to guidelines set out in the future *LARP*. The Panel recommends that the Government of Alberta continue to work toward timely completion of the *LARP* biodiversity management framework and that it include wildlife-habitat-loss thresholds to guide the development of future oil sands projects.

[790] The Panel recommends that the Government of Canada ensure that Shell develop and implement a follow-up program that requires collecting additional detailed baseline data on the distribution and abundance of species at risk and migratory birds in the LSA and drawdown zone, before any site disturbance, to corroborate Shell's HSI model predictions. The follow-up program should also monitor changes in local populations' habitat use during Project construction and operation and after closure to further validate Shell's predictions.

Cumulative Effects

Evidence

[791] Shell quantitatively assessed the significance of the effects of changes in the RSA from the PIC to the application case and the PDC for wildlife before reclamation based on the assumption that all future projects occur simultaneously. Shell based its predictions on the assumption that the influx of wildlife into the reclaimed landscape will be determined by the proximity of potential immigrants in neighbouring landscapes, the presence of wildlife movement corridors, and the age and developmental stage of the reclaimed land. Shell said that the effects presented were conservative and represented worst-case scenarios.

[792] OSEC stated that Shell's predictions were not conservative or worst-case scenarios because it did not consider exploration of existing oil sands leases, or planned development consistent with stated industry expansion goals. OSEC stated that Shell's assessment did not represent the actual full extent of development in the PDC.

[793] Shell considered that the overall cumulative effects from the PIC to the application case and to PDC on barred owl, beaver, black bear, lynx, Western toad, fisher, Canada warbler, horned grebe, olive-sided flycatcher, rusty blackbird, wood bison, yellow rail, short-eared owl, and wolverine in the RSA would be adverse but not significant. Shell concluded that although declines in abundance may occur for these species as a result of development, given the areal extent of remaining high suitability habitat in the RSA, it was unlikely that the resilience of these populations in the RSA had been compromised. Shell stated that its population viability analyses (PVAs) conducted for moose and black bear supported this conclusion.

[794] Given that there is evidence that both the woodland caribou and black-throated green warbler are declining to extirpation in the RSA, Shell considered the overall cumulative effects from the PIC to the application case and to PDC for these species to be significant and adverse.

[795] Shell stated that declines in abundance from the PIC to the application case would be high in magnitude for the barred owl, black-throated green warbler, Canada warbler, rusty blackbird, woodland caribou, and yellow rail before reclamation. Shell estimated moderate magnitude population declines from the PIC to the application case for the horned grebe, fisher, common nighthawk, olive-sided flycatcher, wolverine, beaver, black bear, and moose.

[796] Shell stated that declines in abundance from the PIC to the PDC would be high in magnitude for the barred owl, Canada lynx, horned grebe, wolverine, black-throated green warbler, Canada warbler, rusty blackbird, woodland caribou, and yellow rail before reclamation. Shell estimated moderate magnitude population declines for beaver, common nighthawk, olive-sided flycatcher, moose, and black bear from the PIC to the PDC.

[797] EC stated that the population-level consequences of cumulative habitat loss in the RSA were unknown for most species at risk and migratory birds; however, habitat loss can be a principle factor contributing to population declines. In particular, EC noted that populations of many migratory birds and species at risk were already declining in Alberta. EC further stated that limited information was available on population trends and thresholds of many species at risk and migratory birds in the oil sands region and on the cumulative effects of industrial development.

[798] Fort McKay had concerns about cumulative effects. In particular, Fort McKay submitted that ALCES modelling[10] conducted for the development of the *TEMF* and for the Government of Alberta in the development of the *LARP* indicated that at the current rate of oil sands development, severe declines in wildlife populations will occur, in some cases 60 per cent below the natural range of variation within 20 years (e.g., moose and fisher). The ALCES simulations also indicated that the density of linear features (e.g., pipeline rights-of-way, seismic lines) was a primary cause of these declines. *TEMF* predicted that declines would continue unless land use

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[10] ALCES Group. 2009. Lower Athabasca Regional Plan. ALCES III Scenario Modeling. Summary and technical results for Scenario Package One. Prepared for Worley Parsons by the ALCES Group, June 2009. 179pp.

changes were made in the oil sands region. Fort McKay further stated that previous wildlife surveys were not useful for assessing wildlife populations and cumulative effects in the oil sands region and in Fort McKay's traditional territory. Fort McKay concluded that, essentially, no meaningful trends about regional population and cumulative effects on wildlife populations can be determined from existing data.

[799] Shell stated that the environmental consequences of effects on habitat during operations from the PIC to the application case ranged from moderate to high for all KIRs and species at risk with the exception of short-eared owls, for which effects on habitat were considered negligible. Shell also stated that most effects on habitat from the PIC to the application case were due to disturbances that were already present in the base case. As a result, Shell stated that the environmental consequences of effects on high-suitability habitat from the PIC to the application case are the same as those from the PIC to the base case for all KIRs and species at risk with the exception of the western toad.

[800] Shell predicted that high suitability habitat for western toad would decrease by 19 per cent from the PIC to the base case and by 21 per cent from PIC to the application case, resulting in a high magnitude environmental consequence. Shell attributed declines of western toads to disease rather than habitat loss, and as a result did not consider that there would be a likely significant adverse effect.

[801] Shell stated that most effects on habitat from the PIC to the PDC were similar to those from the PIC to the base case and application case.

[802] Shell stated that because the precise locations and size of certain planned projects and associated reclamation and re-vegetation plans were unknown for the application case and the PDC, it was very difficult to predict post-reclamation conditions for wildlife at the RSA scale. As such, Shell provided qualitative and not quantitative predictions of wildlife habitat post-reclamation.

[803] EC agreed with Shell that the effects of cumulative habitat loss on many species at risk and the black-throated green warbler at the application case and PDC have a high negative environmental consequence when evaluated relative to the PIC. EC stated that a number of studies and analyses have demonstrated high levels of existing and potential future habitat loss and possible adverse effects on species at risk and migratory birds in this region. As such, EC stated that it is concerned about the level of habitat loss that Shell has identified both at the application case and the PDC, for a number of species at risk and migratory birds. EC stated that these effects will be long-term in duration and possibly permanent, depending on the success of reclamation, particularly for wetland (lowland) dependent species.

[804] According to OSEC, cumulative effects from the application case and the PDC will exceed the CEMA wildlife habitat threshold given in the *TEMF*, which is 10 per cent below the limit of the NRV. OSEC stated that any projected declines in habitat more than 20–30 per cent of the preindustrial condition could be considered as inconsistent with CEMA's recommended wildlife thresholds. OSEC concluded that if the Project and other proposed projects were approved, 11 of 19 assessed species will lose more than 20 per cent of their high value habitat in the 2.3 million hectare terrestrial RSA at the application case as will 13 of 19 assessed species in the PDC. OSEC further stated that these values did not represent the full picture of disturbance in the RSA given that Shell did not include many reasonably foreseeable disturbances.

[805] OSEC said that projected habitat losses in the 20–60 per cent range over an area far larger than the Fort McMurray Athabasca Oil Sands Sub-Regional IRP were not consistent with the IRP direction to maintain habitat and promote increased populations of rare and endangered species. OSEC also noted that projected impacts within the Fort McMurray Athabasca Oil Sands Sub-Regional IRP area itself would be significantly higher than those in Shell's RSA.

[806] OSEC stated that Shell's methods for assessing significance of effects on wildlife based on whether resiliency of populations in the RSA had been compromised were without merit. OSEC concluded that Shell's EIA exceeded the threshold used by the panel assessment of the Total Joslyn North Mine Project (*ERCB Decision 2011-005*) for determining significant adverse effects for KIRs and species at risk assessed at the application case. OSEC further stated that in addition to ignoring previous Panel decisions (e.g., TOTAL), Shell is also ignoring CEMA and policy guidance on significance of predicted wildlife habitat losses in northeastern Alberta. OSEC said that Shell's proposition that regional extirpation of a species was an appropriate threshold for a significant adverse effect, was setting the bar far too low. EC said that given the high level of cumulative habitat loss identified for several species at risk in the RSA compared with the PIC, any contribution of the Project to cumulative habitat loss for species at risk should be mitigated. To that end, EC recommended a systematic, rigorous, and hierarchical approach that includes compensation as described under the Project Effects subsection.

[807] The *Fort McKay Specific Assessment* showed that a large amount of wildlife habitat has already been removed from Fort McKay's traditional territory. This study concluded that the environmental consequence of habitat change is high for moose, beaver, Canada lynx, and fisher/marten suggesting that the wildlife habitat of those species had been severely impacted by oil sands development.

[808] OSEC stated that given delays in implementing the *LARP*, the *TEMF* is the most appropriate guidance for determining if proposed wildlife effects in the oil sands were in the public interest and conform to the broad IRP directive to maintain wildlife habitat. OSEC emphasized that previous oil sands panels have pointed to the importance of the *TEMF* in determining the significance of cumulative effects. In *ERCB Decision 2011-005*, the Panel stated that it believed that the *TEMF* provided useful ways to manage cumulative effects on wildlife within the area of the RMWB. In particular, OSEC presented that the *TEMF* includes a threshold for constraining the intensive zone[11] (area of oil sands projects under development) to less than 14 per cent of the RMWB at any time. According to its own analysis, OSEC determined that this threshold would be exceeded by the PDC given that proposed and approved oil sands projects now cover 21 per cent of the municipality. OSEC concluded that concurrent development of only a few of the PDC projects would exceed the highest level of intensive development zone recommended by CEMA. OSEC warned that future oil sands projects will likely further exacerbate these effects because 51 per cent of the RMWB has been leased for oil sands development.

[809] Shell rebutted OSEC's analysis, stating that it was an overstatement of the planned conditions in the RMWB because its resolution is at the quarter-township level. Based on its own

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[11] The TEMF recommends the application of a Triad land management approach that involves the identification of three land use zones: intensive, extensive, and protected. CEMA defines an intensive zone as an area that is characterized by bitumen extraction comprising 5 per cent to 14 per cent of the RMWB at any time.

analysis, using hectares instead of quarter townships, Shell estimated that the area of intensive use in the RMWB is about 8 per cent of the RWMB.

[810] According to OSEC, the cumulative effects on wildlife described in the EIA from PIC to application case and to PDC were the highest levels of regional wildlife effects ever described in an oil sands project application particularly with regard to wildlife habitat loss. OSEC also stated that the effects on wildlife in the EIA are inconsistent with the policy direction of the Fort McMurray Athabasca Oil Sands Sub-Regional IRP, the *LARP*, and federal and provincial legislated policies of sustainable development, *EPEA*, *SARA*, and *CEAA, 2012*. OSEC pointed out that the IRP has as one of its goals, "to protect wildlife species considered sensitive to disturbance or environmental change and to promote increased populations and distribution of species considered rare or endangered (e.g., wolverine, woodland caribou)."

[811] OSEC stated that it is clear that the cumulative effects of reasonably foreseeable disturbance on wildlife now exceed the threshold used in a previous panel assessment to determine significant adverse effects. OSEC further stated that Shell had not provided a plan to adequately mitigate these significant adverse effects, and as such the Project was not in the public interest and should not be approved.

[812] OSEC stated that should the Project proceed, Shell should be required to develop and submit a verifiable mitigation strategy including a requirement for the purchase and conservation of ecologically significant private boreal forest lands, the restoration of existing disturbance footprints in northeastern Alberta, and/or strategies to retire harvesting rights on public lands on a three hectare offset for each hectare of project disturbance basis. EC and Aboriginal groups have also stated that conservation offsets are required to mitigate wildlife habitat loss in the RSA.

[813] Shell stated that the overall risks to wildlife health will be low and that there would be no effects on wildlife populations based on estimated wildlife exposures to predicted concentrations in air, soil, or surface water. ACFN, MCFN, and FMMFN #468 provided information from its members regarding changes they have seen in a number of fish and animals, such as meat discolouration, changes in the taste of moose meat, tumours, and abnormal looking organs. Members have also noted behavioural changes in some animals.

Analysis and Findings

[814] The Panel notes that although Shell based its analysis of cumulative effects on wildlife on the results of predicted changes to abundance, habitat, and movement, most interested parties focused their concerns around projected habitat loss. In addition, the Panel believes that changes to habitat as a result of future development scenarios and the potential for reclamation are more tangible measures than changes to wildlife abundance or movement. These latter two factors would tend to have a greater number of assumptions associated with their predictions, as they would be subject to many more unknowns, such as population dynamics, severe weather events, predator-prey/food web relationships, declines in other parts of the range, etc. The Panel therefore directed most of its analysis around Shell's predictions for habitat loss, with additional consideration for the size of Shell's chosen RSA and the potential uncertainty around these predictions.

[815] The Panel recognizes that loss of wildlife habitat as a result of existing and proposed development in the RSA is very high for a number of species (some of them species at risk) and exceeds some of the critical habitat thresholds proposed in the literature and in regulatory documents (e.g., IRP and the *TEMF*). The Panel recognizes that the *TEMF* recommends that wildlife habitat loss be constrained to a threshold of below 20 per cent, a threshold that was used by the Joint Review Panel for the Joslyn North Mine Project. The Panel understands that if the same threshold was applied for the application case, 11 out of 19 species at risk and wildlife KIRs would have more than 20 per cent high- or moderate-quality habitat loss and at the PDC, 13 out of 19 would have more than 20 per cent high- or moderate-quality habitat loss. The Panel notes that Shell participated in the development of the *TEMF* and the creation of guidelines and thresholds within it.

[816] The Panel notes that Shell did not use disturbance guidelines provided in *TEMF* (maintain disturbance in the RMWB to between 5 and 14 per cent). The Panel recognizes that if *TEMF* were used, the PDC scenario would exceed the allotted area available for intensive development in the RMWB. The Panel recognizes that Shell and OSEC have each attempted to estimate the intensive zone in the RSA using different means (per hectare basis versus quarter township, respectively). The Panel notes that the *TEMF* outlines that the quarter township method should be used when estimating the intensive zone.

[817] The Panel notes that Shell predicted the greatest losses of habitat (more than 40 per cent at the PDC) for species that are old-growth- and wetland-dependent such as barred owl, Canada warbler, caribou, wood bison, and black-throated green warbler. The Panel is aware that many of the species at risk that will be affected by habitat loss from the Project are already subject to large-scale declines in northeastern Alberta, many as a result of ongoing industrial activities.

[818] The Panel is aware that Shell's models of habitat availability at the RSA have numerous sources of error that could greatly affect model predictions. The Panel acknowledges that Shell did not provide any measures of the error associated with these models, but that it could be larger than the ±20–25 per cent error associated with Landsat data alone. Consequently, the Panel recognizes that the estimates of wildlife habitat availability in the RSA post-closure could be considerably different than that predicted by Shell, and potentially much less habitat may be available. The potential loss of habitat could increase substantially if the Panel had a means of estimating the amount of error associated with Shell's HSI modelling and the amount of error associated with uncertainty around application case development and reclamation effectiveness.

[819] The Panel understands that under *SARA*, if a project is carried out, measures must be taken to avoid or lessen adverse effects on species at risk and to monitor them. The Panel is also aware that in the *Addressing Species at Risk Act Considerations Under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada* (*SARA-CEAA* guide), the obligation to identify and mitigate adverse effects on listed wildlife species is independent of the likely significance of the adverse effects. The Panel acknowledges that in *ERCB Decision 2011-005*, that panel considered any net harm to species at risk to be significant.

[820] The Panel notes that for guidance on wildlife habitat thresholds and the protection of wildlife habitat, Shell relied heavily on the recently approved *LARP* and Alberta's commitment to develop and implement a biodiversity management framework under the *LARP*. The Panel

recognizes that once the biodiversity management framework under *LARP* is complete, it will be useful for directing development in the Lower Athabasca Region. However, in the interim, Shell should utilize existing guidance such as *TEMF* in setting thresholds for assessing significant effects on wildlife. The Panel further recognizes that the *LARP* itself states that, "Within the Lower Athabasca Region, integrated resource plans have been developed which identify objectives for long term management of specific landscapes. These plans represent the Government of Alberta's resource management policy for public lands and resources and are intended to be a guide for decision-makers." The Panel notes that the IRP is in place for the RSA.

[821] The Panel understands that the effects on wildlife and particularly species at risk at the application case and the PDC are inconsistent with the guidance provided in the IRP, which has as a goal to protect wildlife species considered sensitive to disturbance or environmental change and to promote increased populations and distribution of species considered rare or endangered (e.g., wolverine, woodland caribou).

[822] The Panel understands that for many species at risk and migratory birds, such as the woodland caribou and the black-throated green warbler, it is the cumulative effects of industrial activities, including oil and gas and forestry activities that have led to the predicted decline to extirpation.

[823] The Panel understands that interested parties contend that mitigation measures to account for this scale of habitat loss are not sufficient and strongly recommended conservation offsets if the Project goes forward.

[824] The Panel recognizes that the cumulative effects on wildlife described in the EIA from PIC to application case and PDC are the highest levels of wildlife habitat loss ever described in an oil sands project application. The Panel is not surprised that this is the case because it includes all of the projects that proceeded to date, all that have been approved, the Project, some projects that are planned but not necessarily applied for and disturbances associated with natural processes (forest fire).

[825] The Panel is particularly concerned about effects on species at risk and migratory birds as a result of the application case. The Panel acknowledges that there are not many options for mitigating wildlife habitat loss for oil sands mines without the sterilization of bitumen. The lack of mitigation measures proposed by Shell that have been shown to be effective in mitigating effects on wildlife habitat loss, the inability to reclaim peatlands, and the time lag to recovery of old-growth forests all compound the issue.

[826] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on wildlife based on the application case and the PDC:

- The loss of wildlife habitat in the RSA is **likely**—Shell will clear the Project footprint (along with other projects) resulting in a permanent loss of some habitat types and a long time lag to the restoration of others. Likewise, for many species at risk for which habitat loss is a known serious threat to their recovery, the likelihood of declines in species abundance is also high.

- The magnitude will be **high**—given that losses to habitat for some species are in the hundreds of thousands of ha.
- The geographic extent is **regional**—affecting the RSA and beyond, given that many species are large and mobile with home ranges that extend beyond the RSA.
- The duration is **long-term**—given the timeframe to restore some wetland habitat, old-growth forest, and peatland is still not demonstrated for oil sands projects. Also, many wildlife species are slow growing and long lived, therefore, it may take a long time for animals to return to areas after closure.
- The effects are **irreversible in the medium to long term**—given that no evidence suggests that wetland and old-growth habitats can be reclaimed in the medium to long term and some species are already declining to extirpation in the RSA (e.g., black-throated green warbler and caribou) with no evidence that they will return.
- The ecological context of the oil sands region—the area in which the Project is taking place has already been adversely affected by human activities and as such, many species are already undergoing large-scale declines as a result of these industrial activities (e.g., caribou, black- throated green warbler and potentially others like yellow rail).

[827] Given this analysis and the ineffectiveness of proposed mitigation measures, the surpassing of existing thresholds for wildlife habitat loss by over half of all species analyzed by Shell, the resultant changes to the ecosystem resulting in a loss of wetlands and a landscape dominated by upland ecosystems, and the pre-existing effects on species at risk and migratory birds in the oil sands region, the Panel finds that there would be significant adverse cumulative effects on species at risk and migratory birds in the RSA as a result of the application case and the PDC when compared with the PIC. The Panel considers cumulative effects on woodland caribou, black-throated green warbler, Canada warbler, horned grebe, rusty blackbird, western toad, and yellow rail to be particularly significant, given more than 20 per cent loss of high- or moderate-quality habitat and reliance on peatland or old-growth habitats.

[828] The Panel is aware that the *LARP* states that the province is committed to progressive reclamation to help ensure that environmental and land management goals are met. While more timely reclamation of mining-related activities should be pursued, the Panel understands that there may be limited opportunities for significant improvements in the timeliness of mine reclamation until significant improvements are made in the management of fine-fluid tailings, reducing the size and number of tailings ponds required.

[829] The Panel recommends that the Governments of Canada and Alberta ensure that the best available research and development is used to improve reclamation of wildlife habitat in the oil sands region in order to provide habitat for these species as soon as possible.

[830] The Panel believes its recommendation regarding consideration of the need for conservation offsets by Alberta and Canada would also help mitigate effects to species at risk and migratory birds should the use of offsets be required. The affected species described in this section should be considered in any determination of offsets.

[831] The Panel recommends that until the biodiversity management framework and any associated thresholds are developed under *LARP*, the Governments of Canada and Alberta ensure

that oil sands proponents consider thresholds and guidelines for assessing the significance of project effects that are available in existing documents, namely the *TEMF* and the Fort McMurray IRP.

[832] The Panel recommends that the Governments of Canada and Alberta in collaboration with key stakeholders collect baseline data, and monitor and report on any future changes to the distribution and abundance of species at risk and migratory birds in the oil sands region. The data should be made available for future CEAs by proponents in the oil sands region as well as to Shell to allow it to confirm its EIA predictions.

[833] The Panel recommends that the Governments of Canada and Alberta, industry, Aboriginal groups, and other key stakeholders, work together to assess the return of wildlife to reclaimed oil sands affected landscapes.

Woodland Caribou

Project Effects

Evidence

[834] According to Shell, species at risk, such as woodland caribou, that rely on old-growth and wetland habitats in the LSA, will have less high- and moderate-quality habitat in the LSA after reclamation. Shell said that the Project footprint will result in the direct removal of approximately 1300 ha of high-quality caribou habitat and 3000 ha of moderate-quality habitat in the LSA. However, Shell also said that woodland caribou were virtually absent in the LSA, and because the nearest designated caribou range is several kilometres away, it anticipated negligible effects on caribou due to the Project.

[835] ACFN suggested that Shell's statement was tantamount to an admission that caribou have already been so greatly affected by human activities that they are now absent from that ecosystem and no mitigation was required in trying to bring them back.

[836] EC indicated that to the best of its knowledge, the Project does not occur within caribou range, and there have been very few sightings of caribou in the area. However, EC acknowledged that the recent federal recovery strategy for woodland caribou may not take into account new data provided by Aboriginal groups that suggest that caribou are in the LSA.

[837] ACFN, Métis Region 1, and the NSFMFM and Clearwater Band disagreed with Shell's and EC's view that caribou do not use the Project area, providing evidence of recent sightings and habitat use within the proposed Project footprint. Interested parties further stated that caribou used the wetlands and old-growth habitat in the LSA as shelter from predators and to raise their young.

[838] ACFN stated that the Project will remove or affect habitat for woodland caribou, a species that is traditionally relied upon given that they were once numerous in the region. ACFN members were concerned that if the Project proceeds, the caribou will be affected because the area will be made unusable. Specifically, ACFN noted that within the Project LSA, high-quality woodland caribou habitat will be impacted by direct disturbance. Mr. Laviolette was particularly

concerned about the potential project effects on caribou habitat found on the muskeg south of McClelland Lake because he believed it was an important calving area.

[839] FMMFN #468 expressed concern that the Project will affect the habitat, mobility, and mortality of caribou, a species important for the exercise of their traditional rights.

[840] The NSFMFM and the Clearwater Band stated that there were caribou from the Audet and Steepbank herds on Shell's lease and that the muskeg area on the Project site was an important calving area. The NSFMFM and the Clearwater Band explained that the Audet and Steepbank herds were now merged with the Richardson herd. Both groups also explained that there were some sources of salty water on Shell's lease and that this salty water attracts caribou. They were of the opinion that the sources of salty water were important to the animals and will be lost because of the Project.

[841] Shell referred to the federal recovery strategy for woodland caribou, which states that the greatest threats to caribou were habitat alteration/degradation and predation. In particular, the recovery strategy outlined that human-caused habitat alterations (e.g., development of linear features such as roads and seismic lines) have been shown to facilitate movement of predators within the boreal forest and hence can increase the abundance, distribution, and hunting efficiency of species that prey on boreal caribou.

[842] Shell said that it will use long sightlines wherever possible in the LSA to reduce potential for vehicle collisions with wolverines; however, EC stated that long, straight roads in the LSA and surrounding area can increase mortality risk to caribou by facilitating predator efficiency, particularly by wolves.

[843] EC stated that the Project footprint will reduce available habitat for caribou predators (namely wolves) and force them into the surrounding RSA along with many of their prey (deer and moose). The recovery strategy identified critical habitat for caribou that was only 5 km away from the LSA (the Richardson Range). The recovery strategy indicates that given a current disturbance rate of 82 per cent, the Richardson Range is not self-sustaining and prescribes immediate action to reverse this negative trend. EC said that an increase in predators could increase the threats to caribou in the Richardson Range and make it even more difficult to reverse the negative trend and create a self-sustaining population within the critical habitat.

[844] Shell stated that deer were invading northeastern Alberta, in part because of the prevalence of early seral habitats to which they were well adapted. Shell further acknowledged that more deer on the landscape will result in increases in their predators, namely wolves. Shell further stated that clearing the LSA will result in a situation where additional deer and wolves may be present in the landscape and may affect caribou within the nearby Richardson Range.

[845] EC stated that Shell has not proposed any mitigation measures for reducing this potential increased predation of caribou in the adjacent Richardson Range critical habitat. EC further stated that if the Project goes forward, follow-up and monitoring of movement of wolves and their prey will be required.

[846] EC indicated that the recovery strategy requires Alberta to develop a range plan for each nonsustaining caribou herd to ensure long-term recovery of woodland caribou across Canada. EC suggested that a range plan for Alberta was 3–5 years away from completion. When questioned

by ACFN on what tools were available to ensure "immediate action" as prescribed in the recovery strategy, EC responded that there were mechanisms in *SARA* that could be used, such as the emergency protection order.

Analysis and Findings

[847] The Panel acknowledges the traditional and cultural importance of caribou to Aboriginal people. The Panel acknowledges that numbers of caribou in the LSA are likely to be low, given that they have already been adversely affected by industrial development in the oil sands region. However, the Panel recognizes that historically, caribou were found in much greater numbers.

[848] The Panel acknowledges that there is considerable debate about the presence of caribou in the LSA. Although it appears from evidence provided by Aboriginal groups that caribou do use the Project area, the frequency and magnitude of this use is uncertain. The Panel recognizes that potential caribou habitat does still occur on the Project lease but it does not fall within critical habitat identified in the recovery strategy. Given the lack of approved range plans, the overall importance of this habitat is uncertain; however, because of the declining status of caribou, largely as a result of human disturbances, all suitable habitat loss (e.g., old-growth forest and peatlands) is potentially significant in the ability of caribou to recover to self-sustaining population levels.

[849] The Panel understands that some caribou herds are under particular threat in Alberta and the oil sands region and are thought to be declining to extirpation. As such, the Panel believes that there should be particular attention given to restoring and protecting critical habitat for caribou as outlined in the federal recovery strategy. The Panel is aware that the closest critical habitat is only 5 km from the LSA, and as such, the Panel shares the opinion with EC that indirect project effects on caribou in the Richardson Range through increased predation by wolves is possible. Further, the Panel believes that increased predation may impede the ability of the caribou in the Richardson Range to meet the population objectives as outlined in the recovery strategy.

[850] Based on the criteria provided in the Agency's guide, *Determining whether a project is likely to cause significant environmental effects* (November 1994), the Panel used the following approach to determine the significance of project effects on caribou:

- The loss of caribou habitat in the LSA is **likely**—the Project footprint will be cleared, peatlands will not be recovered, and there will be a considerable time lag for old-growth recovery. The loss of habitat for caribou predators (e.g., wolves) and their prey (e.g., deer) is also likely, resulting in their potential movement to nearby critical habitat in the Richardson Range.
- The magnitude will be **low**—while over 10 000 ha will be cleared, the area is not currently used by many caribou.
- The geographic extent is **regional**—given that critical habitat for caribou in the Richardson Range is only 5 km away, a distance that is well within the home range of caribou, caribou predators, and their prey (moose, deer). Hence, loss of habitat for these predators may affect species viability on a regional level in the critical habitat.

- The duration is **long-term**—given that the time frame for caribou habitat (both wetlands and old-growth) to return to its former biodiversity and function is more than 80 years and peatland restoration is still not demonstrated for oil sands projects. Likewise, the ability of caribou to recover after closure will be highly linked to characteristics of their life history, i.e., longer-lived, slower-growing species like caribou will take much longer to re-establish after reclamation.
- The effects are **largely irreversible**—given that there is still no evidence that peatlands can be successfully reclaimed, peatlands constitute 85 per cent of wetland habitat lost and caribou are declining to extirpation in the nearby Richardson Range.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, as have caribou. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[851] Given this analysis and the categorization of caribou in the nearby Richardson Range as being "not self-sustaining", the requirement in the federal recovery strategy for immediate actions to avoid extirpation in this range, and the inadequacy of Shell's proposed mitigation measures, the Panel finds that there are likely adverse project effects on caribou in the nearby Richardson Range. However, given that the habitat within the LSA does not currently appear to be used by caribou in any substantial number, the Panel does not find the Project to have significant adverse effects on caribou.

[852] The Panel recommends that the Government of Alberta in consultation with the Government of Canada and interested Aboriginal groups in the oil sands area produce a range plan for caribou in the designated critical habitat of the Richardson Range as soon as possible. This range plan will outline specific steps for providing immediate action to reverse the current level of disturbance, as prescribed in the federal recovery strategy. These steps should include direction for ensuring that indirect effects (e.g., increased predation resulting from nearby land clearing) on already significantly disturbed populations such as the Richardson Range are minimized or avoided.

[853] The Panel recommends that the Governments of Canada and Alberta ensure that Shell monitors the distribution and behaviour of caribou predators (namely wolves) and their usual prey (e.g., deer and moose) following clearing of the LSA to assess the potential indirect effects to the Richardson Range.

[854] The Panel recommends that the Government of Canada ensure that Shell conducts further research and survey work to determine the extent to which caribou are using the LSA, and if they are, to determine the number of people inhabiting the area and their connection to the caribou in the Richardson Range. The Panel recommends that the Government of Canada ensure that Shell works collaboratively with Aboriginal groups in carrying out this research. The results of this work should be provided to the Government of Alberta to help update caribou range plans in Alberta.

Cumulative Effects

Evidence

[855] Shell stated that all three woodland caribou populations in the RSA appear to be declining to extirpation because the indirect effects of industrial development on predator-prey dynamics. Shell predicted a high-magnitude decline in woodland caribou abundance in the RSA from PIC to base case, application case, and the PDC. Shell said that most of the effects on caribou occurred between the PIC and the base case. For the application case, Shell predicted a 41 per cent (171 753 ha) and a 92 per cent (1652 193 ha) decline in high- and moderate-quality caribou habitat, respectively, in the RSA. For the PDC, Shell predicted a 47 per cent (199 988 ha) and a 93 per cent (1 665 049 ha) decline in high- and moderate-quality caribou habitat, respectively, in the RSA. Shell considered the cumulative environmental effects on woodland caribou to be likely, significant, and adverse.

[856] The federal recovery strategy for woodland caribou, presented as evidence by Shell, indicates that three herds with critical habitat are identified in the RSA: the Red Earth, Richardson, and West Side Athabasca Ranges, and that all three of those herds are considered in the recovery strategy to be not self-sustaining. The recovery strategy outlines that the recovery objective for herds that are not self-sustaining involves stabilizing and achieving self-sustaining status, and that this requires immediate action for boreal caribou ranges where local populations are declining. The recovery strategy also prescribes that habitat management will be necessary for nonself-sustaining herds, and identifies 65 per cent undisturbed habitat in a range as the disturbance management threshold. As such, for boreal caribou ranges with less than 65 per cent undisturbed habitat, restoration to a minimum of 65 per cent undisturbed habitat will be necessary. Both the Richardson and the West Side Athabasca Ranges have less than 65 per cent undisturbed habitat (18 and 31 per cent undisturbed habitat, respectively).

[857] Shell predicted that woodland caribou will experience a decrease in the amount of high and moderate suitability habitat after reclamation relative to the PIC, attributing this decrease to the loss of peatlands. Shell further predicted that reclamation landscapes will increase abundance of white tailed deer, which may increase wolf populations in the reclamation landscape. Shell attributed the observed decreases in caribou from PIC to base case due to predation by wolves.

[858] EC stated that it was concerned about the level of habitat loss for woodland caribou that Shell identified in both the application case and the PDC.

[859] OSEC provided evidence from the Dover EIA that suggested that unless trends are reversed, woodland caribou populations in the RSA were estimated to decline to near extirpation after 30 years.

[860] ACFN consider woodland caribou to be culturally important. ACFN indicated particular concerns about project effects on culturally important populations of woodland caribou in the RSA and beside the Project LSA (Kearl Lake area). ACFN further stated that within the RSA, areas of core woodland caribou habitat both north and east of the Project and areas downstream of the Project along the Muskeg and Athabasca Rivers are among the site-specific environmental values most at risk in the application case.

[861] MCFN and ACFN expressed concerns with respect to caribou and that the draft *LARP* does not provide concrete or strong enough consideration of caribou. Both groups said that the proposed provincial caribou policy contains serious flaws and loopholes that suppress caribou protection in favour of economic interests. As such, MCFN and ACFN recommended the following approaches to protect caribou habitat:

- No net loss of woodland caribou habitat
- No net increase in linear disturbance within caribou habitat
- Restoration of historical caribou range that is already disturbed by industrial activities
- Protection of all local populations throughout their historical and current ranges in northeastern Alberta
- Involvement of First Nations in planning, management, and monitoring of caribou

Analysis and Findings

[862] The Panel understands that it is the cumulative effects of industrial activities, including oil and gas activities, that have led to the current predicted decline to extirpation of woodland caribou. The Panel acknowledges that it is both the loss of habitat and the indirect effects leading to altered predator-prey interactions that have put caribou at risk in the RSA. The Panel recognizes that when a species at risk is as highly impacted as caribou, recovery will require a regional effort in order to attempt to rectify current population trends, both inside and outside of critical habitat.

[863] The Panel understands that the federal recovery strategy provides the initial direction needed to bring about caribou recovery, including immediate action to reverse the trends of caribou populations that are considered to be nonself-sustaining, namely all three herds in the RSA. The Panel also understands that habitat management will be necessary in order to meet the target of 65 per cent undisturbed habitat in both the Richardson and West Side Athabasca herds. The Panel further understands that habitat management will require a reduction of both direct (e.g., habitat loss and sensory disturbance) and indirect (predator-prey dynamics) threats in order to reverse the trend for the caribou.

[864] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on caribou based on the application case and the PDC:

- The loss of caribou habitat in the RSA is **likely**—the Project footprint along with other project footprints will be cleared, resulting in a permanent loss of preferred caribou habitat types and a long time lag for the restoration of others (old-growth and peatlands). Habitat loss has been identified in the recovery strategy as a serious threat to caribou recovery; hence, the likelihood of declines in species abundance is also high.
- The magnitude will be **extremely high**—given losses of over one million ha of caribou habitat (e.g., loss of moderate quality caribou habitat of 1 652 193 ha in the application case), and given that this species is already declining to extirpation.

- The geographic extent is **regional**—affecting the RSA and beyond, given that caribou are large and mobile, with home ranges that extend beyond the RSA.
- The duration is **long-term**—given that the timeframe to restore caribou habitat is at least 100 years for old-growth forests, and that peatland restoration is still not demonstrated for oil sands projects. Beyond that, caribou are slow growing and long lived, and it may take a long time for animals to return to areas after closure.
- The effects are **largely irreversible**—given that no evidence suggests that wetland and old-growth habitats can be reclaimed, and that caribou are already declining to extirpation with no evidence of significant recovery action to halt the decline.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities and as such, caribou are already undergoing large-scale declines as a result.

[865] Given this analysis and the lack of proposed mitigation measures shown to be effective, the surpassing of existing thresholds for caribou habitat loss in Shell's analysis, and the threat of extirpation of caribou in the oil sands region, the Panel finds that there would be significant adverse cumulative effects on caribou in the RSA in the application case and the PDC.

[866] The Panel recommends that the Government of Alberta work in cooperation with EC towards the expeditious completion of range plans for caribou in the oil sands region to ensure that immediate action occurs as prescribed in the federal recovery strategy.

[867] The Panel recommends that the Government of Alberta work with Aboriginal groups during development of the biodiversity management framework under *LARP* to specifically address issues related to caribou in the oil sands region. The Panel further recommends that during development of the biodiversity management framework, consideration be given to principles such as no net loss of caribou habitat, limiting linear disturbances in critical caribou habitat, and restoration of historical and present caribou ranges.

Wood Bison

Project Effects

Evidence

[868] Shell stated that it assessed the effects of the Project on potential wood bison habitat in the LSA as having a negative, high environmental consequence during construction, operation, and closure. However, Shell stated that wood bison do not actually occur in the LSA and therefore will not be affected by the Project. Shell did not consider the effects of the Redclay Compensation Lake in its analysis of project effects on bison. Shell said that the main threat to wood bison was disease and that they are not habitat-constrained within the RSA. Therefore, the Project would have negligible effects on wood bison. Shell also indicated that issues surrounding species at risk and the location of the compensation lake would fall under the purview of DFO.

[869] ACFN stated that predation, disease, and habitat were the three main factors contributing to low numbers of wood bison that have to be considered in any recovery plan for the wood bison.

[870] ACFN highlighted that the federal recovery strategy for wood bison under the *SARA* was over 10 years late. EC stated that it will release a draft *SARA* recovery strategy for wood bison toward the end of 2013 and would consult with Aboriginal people before the draft is posted.

[871] ACFN stated that the wood bison was an important traditional resource for the ACFN and that the Project will have negative effects on the Ronald Lake herd, potentially resulting in the extinction of this herd. ACFN stated that there will be substantial losses of wood bison habitat given the proposed site of the Redclay Compensation Lake, which is currently located in the area used by the Ronald Lake herd. ACFN stated that it anticipated that the compensation lake would inundate and destroy observed and known core Ronald Lake wood bison habitat, specifically a habitat type known locally as "buffalo prairie."

[872] ACFN members indicated that the Ronald Lake herd was particularly important as it was the only herd of wood bison available to ACFN hunters outside Wood Buffalo National Park (refer to the Effects on Aboriginal Traditional Land Use, Rights and Culture section for further detail).

Analysis and Findings

[873] The Panel notes that the federal recovery strategy under *SARA* is over 10 years late. The Panel understands that without the recovery strategy in place, it is difficult to determine the importance of the Ronald Lake herd in contributing to the population objectives for the recovery of the species. Similarly, without the identification of critical habitat, it is difficult for the Panel to establish the importance of the area of the Redclay Compensation Lake for meeting the objectives of the recovery of the wood bison population, and hence the significance of environmental effects.

[874] The Panel recognizes that Shell did not consider the area of the proposed Redclay Compensation Lake as being part of the LSA; therefore Shell did not analyze project effects on the wood bison that inhabit this area for project effects. The Panel recognizes that wood bison are no longer found on the east side of the Athabasca River.

[875] The Panel recognizes that wood bison habitat of the Ronald Lake Herd would be affected by the compensation lake and that this might affect ACFN's ability to hunt wood bison. The Panel also acknowledges that ACFN provided little information about the abundance of wood bison in that herd or about the importance of habitat that will be affected by the compensation lake.

[876] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of project effects on wood bison:

- The loss of wood bison habitat as a result of the Project is **likely**—Shell will clear the compensation lake footprint (approximately 303 ha) and not reclaim the existing habitat for bison.
- The magnitude will be **low**—given that hundreds of hectares of habitat available to bison will be cleared.

- The geographic extent is **regional**—given that the home range for wood bison is bigger than the compensation lake footprint alone.
- The duration is **long term**—given that the habitat will not be reclaimed for use by bison.
- The effects on bison habitat are potentially **irreversible**—given that the habitat will be flooded and not available as bison habitat.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, as have wood bison. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[877] Given this analysis and the lack of available information on the relative importance of the Ronald Lake herd to the overall recovery of wood bison, the Panel determines that the project effects on wood bison in the Ronald Lake herd are adverse but are unlikely to be significant, pending further information, to be identified in the anticipated recovery strategy, on population objectives and critical habitat of wood bison.

[878] Given that the recovery strategy is considerably overdue, the Panel recommends that the Government of Canada consult with Aboriginal groups to help inform the federal recovery strategy for wood bison and ensure its expeditious delivery. The Panel also recommends that critical habitat for bison be identified in the federal recovery strategy to provide context for future decisions on oil sands development in the Athabasca region.

Cumulative Effects

Evidence

[879] Shell's analysis concluded that changes in the RSA from PIC to application case and PDC will have negligible environmental consequences for wood bison abundance, attributing bison decline to disease rather than habitat loss. Therefore, Shell said that there would be negligible decline in wood bison abundance in the RSA from PIC to application case and the PDC. Shell said that it did not consider cumulative effects on wood bison in the RSA to be significant. Dr. Komers, an ACFN expert, agreed with Shell's assertion that bison were not habitat limited in the RSA.

[880] MCFN and ACFN stated that bison were a culturally important species. ACFN expressed concerns about cumulative effects on wood bison in the RSA given their importance to ACFN's cultural practices and traditional economy and the use of the Ronald Lake herd. ACFN stated that large, contiguous areas were essential because of the wide ranging and dispersed nature of wildlife resources in the boreal forest, especially large ungulates such as bison. MCFN said that the conservation areas proposed in the *LARP* do not protect areas that would contain aggregations of habitat for wood bison.

[881] ACFN indicated that historically important subsistence species such as wood bison were already at dangerously low levels, were scarcely available for traditional resource use throughout the region, and the regional landscape is changing in ways that may lead to the disappearance of bison altogether. MCFN indicated that its analyses demonstrated the decline of many wildlife species, such as bison.

Analysis and Findings

[882] The Panel is aware that bison in the RSA are already significantly affected by disease, and that bison are currently found only on the west side of the Athabasca River. The Panel understands from the evidence that habitat loss is not the greatest threat to wood bison.

[883] The Panel is aware that the bison are culturally important for Aboriginal people in the oil sands region and that loss of habitat for the Ronald Lake herd may affect availability of bison in the RSA for ACFN members to hunt. The Panel acknowledges the substantial delay in the development of the wood bison recovery strategy, which makes it difficult to make decisions about the importance of bison habitat in the RSA to recovery of the species as a whole.

[884] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on bison based on the application case and the PDC:

- The loss of bison habitat in the RSA is **likely**—the habitat of the Redclay Compensation Lake will be lost along with the footprints of numerous other oil sands developments on the west side of the Athabasca.
- The magnitude will be **low**—given that losses of bison habitat are in the thousands of hectares and given that habitat loss is not the primary threat to bison.
- The geographic extent is **regional**—affecting the RSA and beyond, given that bison are large and mobile with home ranges that extend beyond the RSA.
- The duration is **long-term**—given that Shell will not reclaim the habitat lost from the Redclay Compensation Lake. Beyond that, bison are slow growing and long lived, and it may take a long time for animals to return to other reclaimed areas after closure.
- The effects are **reversible**—while the loss of habitat for the compensation lake is permanent, other project footprints may be reclaimed.
- The ecology of the oil sands region where the Project is taking place has already been adversely affected by human activities.

[885] Given this analysis and the lack of information about the importance of habitat in the RSA for wood bison and the fact that disease and past management are the most serious threats to bison recovery, the Panel believes that there are adverse but not significant cumulative effects on wood bison as a result of oil sands developments in the RSA.

Moose

Project Effects

Evidence

[886] Shell predicted that the project effects on moose abundance, habitat, and movement after closure and reclamation in the LSA to be either low or negligible. Shell further stated that

increases in upland habitat after reclamation will result in positive changes in the LSA for moose.

[887] ACFN said that the Project will remove or affect moose habitat. Specifically, ACFN noted that within the Project LSA, high-quality moose habitat will be impacted by direct disturbance.

[888] Shell said that moose will not be adversely affected by the Project. According to Shell, moose will move from the LSA to the RSA. It stated that because the RSA was below carrying capacity, the food supply for moose will be sufficient. Shell also said that it predicted the shift in the landscape from wetlands to upland habitats and shrubland habitats preferred by moose would result in positive changes to moose habitat in the LSA. However, to be precautionary, Shell stated it assessed the environmental consequences of the effects of the Project on moose as negative and low in order.

[889] According to several ACFN members, the compensation lake may affect the migration routes of moose and they may move to another location as a consequence. ACFN indicated that moose and deer were increasingly avoiding the Kearl Lake area.

[890] NSFMFM and Clearwater Band stated that they hunt moose within the Project site area and the numbers of moose have declined.

Analysis and Findings

[891] The Panel acknowledges the traditional importance of moose to Aboriginal people. The Panel notes that clearing the Project footprint will reduce habitat for moose.

[892] Although the Panel recognizes that reclamation of the LSA may increase moose habitat, this will not occur for many years. The Panel believes that Shell has not provided clear evidence to support its view that the RSA is below carrying capacity, can absorb any moose displaced from the LSA, and as such, would serve to alleviate the effects of habitat clearing.

[893] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of project effects on moose:

- The loss of moose habitat in the LSA is **likely**—Shell will clear the Project footprint and there will be a time lag for reclamation.
- The magnitude will be **moderate**—given that thousands of hectares of habitat (11 995 ha of moderate- and high-quality habitat) available to moose will be cleared by the Project.
- The geographic extent is **regional**—given that the home range for moose is bigger than the LSA alone and that their population limits extend beyond the LSA.
- The duration is **medium-term**—given that moose should be able to recolonize the early seral habitat of reclaimed uplands (e.g., 40 years). However, the ability of moose to recover after closure will be highly linked to characteristics of their life history, e.g., longer-lived, slower-growing species such as moose will take much longer to re-establish after reclamation.

- The effects on moose habitat are **reversible**—given that moose should be able to recolonize reclaimed upland habitats after closure.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[894] Given the above analysis, the Panel determines that project effects on the LSA moose population are adverse but are not significant.

Cumulative Effects

Evidence

[895] Shell conducted a PVA that estimated the initial abundance, carrying capacity, and population density of the RSA for moose and used it to estimate that the moose population had declined by 12 per cent from the PIC to both the base case and the application case, but it stated that no reliable data on historical population trends was available for moose in the RSA. Shell's PVA also predicted a decline of 20 per cent from the PIC to the PDC. However, the probability of population extirpation remains less than 0.001 per cent in all cases. Shell stated that while there was uncertainty around population size and trends, available data do not suggest major changes were occurring in moose population size in the RSA. Shell concluded that moderate-magnitude population declines were foreseeable for the PDC, but considered the effects on moose from PIC to the PDC to not be significant.

[896] Shell predicted that high-, moderately high-, and moderate-quality moose habitat would decrease by 16, 9, and 8 per cent, respectively, from the PIC to the application case. At the PDC, Shell predicted declines of 24, 15, and 14 per cent for high-, moderately high-, and moderate-quality moose habitat, respectively.

[897] Shell said that a number of factors affected moose population levels in the RSA, including habitat, predation, access, and hunting. Shell further stated that although moose populations in the region were declining, there is nothing to suggest that the primary cause of this decline was habitat loss, given that habitat quality and availability suggest that moose populations in the RSA remain well below the carrying capacity of the environment. Shell considered that the cumulative effects of development on moose are not likely to be significant.

[898] ACFN disagreed with the results of Shell's PVA and believed that, because of contradictions in conclusions, Shell did not consider the traditional ecological knowledge (TEK) provided by ACFN. ACFN said that trappers and Aboriginal people consistently report declining moose numbers in the region, whereas Shell's analysis predicted some growth in moose populations. ACFN further stated that Shell's PVA conflicts with modelling conducted in the development of the *TEMF*; the modelling concluded that moose were already below their NRV and populations will continue to decline.

[899] Fort McKay said that the TEK report filed by Shell documented that Fort McKay members have observed declining population levels in moose. ACFN provided evidence to show that between 1992 and 2008, an average of 42 km^2 (approximately 10 moose home ranges) of

moose habitat have been removed each year from ACFN's RSA and that moose density has declined substantially.

[900] FMMFN #468 also noted declines in abundance of moose. FMMFN #468 indicated that the moose population was now one quarter to one half of what it was 20 years ago and said that this decline was a result of the development of the oil industry.

[901] OSEC provided evidence from the Dover Commercial Project EIA (2010), which stated that unless trends are reversed, Dover estimated moose in the RSA to decline to near extirpation after 30 years. OSEC and FMFN provided other assessments that gave the following as evidence of declining moose populations:

- the survey of wildlife management unit 531 by ESRD, of which about 50 per cent is within the RSA, indicated a decline of 60 per cent in the population between 1994 and 2009; and
- the survey of wildlife management unit 530 by ESRD, of which about 50 per cent is within the RSA, also demonstrates declining population levels compared with past surveys.

[902] OSEC stated that Shell failed to consider in its assessment of significance the Fort McMurray IRP, which provides a population target for moose in the RSA. Shell agreed that the population target for moose set out in the Fort McMurray IRP would not be met and in fact, the moose population was 50 per cent below the target.

[903] ACFN expressed concerns about cumulative effects on moose in the RSA given their importance to ACFN's cultural practices and traditional economy. ACFN stated that large, contiguous areas were essential because of the wide-ranging and dispersed nature of large ungulates such as moose and that at the regional scale the cumulative effects will result in a high environmental consequence to moose.

[904] MCFN stated that moose were a culturally important species. MCFN expressed concern about the cumulative effects on the health and sustainability of moose. MCFN reported that moose in the oil sands region, specifically in the Kearl Lake area, do not taste as good as moose from other areas, such as the Birch Mountains (80 km from the oil sands region). MCFN expressed concern about the health of the moose and believed that fallout and dust may contaminate the plants and contribute to the poor health of moose.

[905] ACFN also noted concerns with the health and taste of moose. For example, a member of ACFN reported killing a moose with evidence of infection in its lungs, and other members reported similar concerns. FMMFN #468 provided information from its members about changes they have seen in a number of animals, including changes in colour and taste of moose meat, tumours, and abnormal-looking organs.

[906] Shell conducted a wildlife health assessment for moose focusing on chemicals of potential concern through inhalation, ingestion, or dermal contact. Shell stated in its wildlife health assessment that the Project would not contribute to potential wildlife health risks.

Analysis and Findings

[907] The Panel understands the cultural and economic significance of moose to Aboriginal people in the RSA. The Panel recognizes that there is some evidence to suggest a decline in moose populations from the PIC to the base case. The Panel also acknowledges that moose populations in the RSA are predicted to decline further in the application case and PDC.

[908] The Panel notes that according to TEK, moose health is a concern and many Aboriginal groups expressed concerns about the health of individual moose. The Panel also acknowledges that Aboriginal groups expressed concerns about the taste of the moose.

[909] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on moose.

- The loss of moose habitat in the RSA is **likely**—Shell will clear the Project footprint and numerous other projects.
- The magnitude will be **high**— given that 151, 621 ha and 246 242 ha of habitat available to moose will be cleared in the application case and PDC, respectively.
- The geographic extent is **regional**—affecting the RSA and beyond, given that moose are large and mobile with home ranges that extend beyond the RSA.
- The duration is **medium- to long-term**—given that moose should be able to recolonize the early seral habitat of reclaimed uplands (e.g., 40 years). However, the ability for moose to recover after closure will be highly linked to characteristics of their life history, e.g., longer-lived, slower-growing species such as moose will take much longer to re-establish after reclamation, particularly if moose in the oil sands region are already in decline and there are not as many individuals to recolonize.
- The effects on moose habitat are **reversible in the medium-term**—given that moose should be able to recolonize reclaimed upland habitat after closure.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities and as such, moose populations may already be declining.

[910] Given this analysis and an expected loss of less than 20 per cent of high-quality moose habitat at the application case, the Panel determines that the cumulative effects on the RSA moose population are adverse but not significant. The lack of reliable population data upon which to assess population trends was also a consideration in the significance determination.

[911] The Panel recommends that the Government of Alberta include updated management objectives for moose for the Lower Athabasca planning region in the biodiversity management framework being developed under *LARP*. The Panel also recommends that the Government of Alberta develop and implement a program to monitor the health and long-term sustainability of moose populations in the Lower Athabasca region, either as part of the biodiversity management framework or as part of other monitoring initiatives currently being developed and implemented. The Panel recommends that the Government of Alberta work with interested Aboriginal groups

in developing the management objectives and monitoring programs for moose populations in the Lower Athabasca region.

Migratory Birds

Project Effects

Evidence

[912] Shell's habitat suitability models predicted that clearing the LSA would reduce habitat available for nesting boreal birds. For all migratory birds, Shell concluded that the loss of habitat in the LSA will have high environmental consequences during construction and operations. Shell suggested that the environmental consequence to the abundance of Canada warbler, common nighthawk, olive-sided flycatcher, peregrine falcon, red knot, black-throated green warbler, and whooping crane will be low during construction and operations.

[913] Shell predicted more than 75 per cent habitat loss before reclamation for all migratory birds it analyzed: black-throated green warbler, common nighthawk, horned grebe, olive-sided flycatcher, rusty blackbird, and yellow rail. Shell predicted over 45 per cent high- or moderate-quality habitat loss at closure for the following old-growth- and wetland-dependent species: black-throated green warbler, common nighthawk, rusty blackbird, and yellow rail.

[914] According to Shell, yellow rail, common nighthawk, horned grebe, and rusty blackbird will all experience decreases in high and moderate quality habitat in the LSA after reclamation. Shell predicted that there will be high negative consequences in the LSA for rusty blackbird, yellow rail, horned grebe, and black-throated green warbler, but high positive consequences for Canada warbler and olive-sided flycatcher. Shell stated that after reclamation, migratory bird populations should recover, resulting in negligible environmental consequences overall. Shell stated that the effects of landscape change in the RSA may have contributed incrementally to population declines in Canada warbler.

[915] EC stated that several migratory birds in the LSA are also species at risk (see appendix 10b).

[916] Shell stated that peatlands within the LSA cannot be reclaimed as wetlands; therefore, the species of migratory birds that will be most negatively affected by the Project will be wetland specialists, such as yellow rail, red knot, horned grebe, and rusty blackbird. Shell suggested that species that will be less affected are those associated with upland forested habitats, such as Canada warbler and olive-sided flycatcher.

[917] Shell predicted that many species of migratory birds will not be negatively affected by habitat loss in the LSA because there is ample suitable habitat in the surrounding RSA that is below carrying capacity for most species, (e.g., Canada warbler, common nighthawk, peregrine falcon, red knot, and whooping crane).

[918] EC stated that there is no evidence to suggest that the surrounding boreal forest can sustain increased numbers of breeding birds or that it is below carrying capacity. It stated that cumulative effects from other proposed projects could reduce habitat availability even further.

EC also stated that using remaining habitat in the RSA to alleviate the effects of the loss of habitat in the LSA to migratory birds is unproven.

[919] Shell stated that it will use 100 m treed buffers around watercourses outside of the Project development area that will maintain breeding and foraging habitat for a number of migratory birds using these areas during the breeding season.

[920] EC stated that although a 100 m buffer may generally be sufficient to maintain movement of forest songbirds, it may not be sufficient to maintain the overall pre-disturbance songbird community. EC further stated that although additional research is required, buffer widths up to 200 m may be required to maintain predisturbance forest bird communities.

[921] Shell said that it used the horned grebe as a surrogate species for waterfowl given that the grebe shares a substantial number of ecological requirements and life stages with ducks and geese. ACFN and EC stated that Shell should have used a species of waterfowl as a KIR. ACFN challenged Shell's use of the horned grebe as being representative of waterfowl and stated that other species such as the lesser scaup would be more appropriate. ACFN stated that the horned grebe belongs to the order Podicipediformes which are not considered to be classified within the waterfowl group. EC stated that the nesting habitat requirements of ducks and geese differ from that of the horned grebe. Shell predicted a loss of 97 per cent of horned grebe habitat due to construction and operations and a 58 per cent loss of high quality-habitat at closure.

[922] EC stated that it was particularly concerned about the loss of yellow rail habitat in the oil sands region, especially in the lenticular fen complex located within and beside the northeast corner of the LSA (see the Effects on Wetlands section). EC recommended that Shell monitor and minimize effects of drawdown on yellow rail habitat within and beside the LSA and avoid direct effects on yellow rail habitat wherever possible.

[923] EC stated that upland vegetation after reclamation would have relatively low biodiversity potential and would support relatively few migratory bird species. In addition, concerns, EC stated that the success of reclamation and recolonization of reclaimed habitats by species at risk and many migratory birds is uncertain and, for old-growth-dependent species (e.g., black-throated green warbler and Canada warbler), will take considerable time to achieve.

[924] EC raised the concern that alteration of Kearl Lake water levels may reduce habitat quality on the lake for migrating and nesting birds, thereby reducing the number of birds using the lake. It said that the alteration may increase the occurrence of birds on nearby tailings ponds, resulting in an increased risk of mortality. EC recommended that Shell design the levee to minimize effects on migrating and nesting birds and monitor use of Kearl Lake before and after alteration of water levels to determine any changes in bird use.

[925] Aboriginal groups stated that the migration pathways for many waterfowl appear to have changed in that they are no longer flying over the oil sands region or using the PAD in the same way. EC confirmed that it has observed the shifting patterns in migration pathways but that further study is required.

[926] EC identified whooping cranes as one of the most endangered birds in North America. Based on a satellite telemetry study that spans spring and fall migration periods between 2010 and 2012, EC presented evidence that 40 per cent of the population migrates over the oil sands

region and that 30 per cent of those birds landed within 1 km of a tailings pond (refer to the Effects of Tailings Ponds on Migratory Birds section).

[927] ACFN stated that the Kearl Lake area of the Project is very important for hunting waterfowl (refer to the Effects on Aboriginal Traditional Land Use, Rights, and Culture section).

Analysis and Findings

[928] The Panel notes that a substantial amount of habitat for migratory birds that are wetland- or old-growth-forest-dependent will either be lost entirely or lost for an extended period of time. Many of these species are also species at risk whose numbers are declining throughout Alberta, particularly yellow rail, rusty blackbird, and horned grebe.

[929] The Panel believes that Shell's assumption that the RSA still has ample habitat for migratory birds is unproven because there is no evidence to show that the RSA will be able to absorb the influx of boreal birds whose habitat has been cleared in the LSA. Accordingly, the Panel does not accept Shell's determination of project effects on migratory birds as being not significant. The Panel also notes that several affected boreal migratory birds are species at risk, for which a requirement to mitigate adverse effects arises under section 79 of *SARA*.

[930] The Panel remains unclear about Shell's intended mitigation of project effects on nesting birds by establishing 100 m buffers "outside of the project development area" because it does not know how a mitigation measure outside of the Project development area can mitigate project effects on migratory birds, or how Shell plans to influence buffer size outside of the Project development area. The Panel is unclear as to why Shell has chosen to list this as a mitigation measure.

[931] Given that Shell considered the horned grebe to be a surrogate waterfowl KIR and that Shell predicted large declines in high-quality habitat loss in the LSA after reclamation (58 per cent) for this species, the Panel finds that there is a potential for large-scale losses to waterfowl habitat after reclamation. The Panel recognizes that loss of waterfowl habitat may have important ramifications for Aboriginal hunting and use of the species.

[932] The Panel understands that Shell chose the black-throated green warbler as a KIR to represent boreal songbirds and that predicted large-scale declines for this species in the LSA may indicate the potential for similar declines for the many species of boreal songbirds that use the LSA.

[933] The Panel recognizes that the Project area does not provide critical habitat for endangered whooping cranes (nesting or overwintering), therefore habitat loss is not an issue for this species. However, the Panel has noted that should species at risk land in a tailings pond, a significant effect would occur (refer to the Effects of Tailings Ponds on Migratory Birds section).

[934] Based on the criteria in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the following approach was used to determine the significance of project effects on migratory birds.

- The loss of migratory bird habitat in the LSA is **likely**—the Project footprint will be cleared and there will be substantial habitat loss.

- The magnitude will be **moderate**—given that thousands of hectares of habitat available to migratory birds will be cleared.
- The geographic extent is **regional**—given that populations of migratory birds extend beyond the boundary of the LSA and their population limits extend beyond the LSA.
- The duration is **long-term**—given that the timeframe for much migratory bird habitat (wetlands and old-growth) to return to its former biodiversity and function is more than 80 years and that peatland restoration is still not demonstrated for oil sands projects. In addition, the ability for migratory birds to recover in the LSA after closure will be highly linked to the health of populations in the RSA, and current evidence suggests some substantial declines several migratory birds in the oil sands region.
- The effects are potentially **irreversible**—given that there is no evidence that peatlands can be successfully reclaimed, and peatlands constitute 85 per cent of wetland habitat lost in the LSA which acts as habitat for migratory birds. In addition, the time lag to restoration of old-growth forests (which provides nesting habitat for boreal birds), is well beyond 80 years. There is also no evidence in the oil sands region that old-growth forest can be restored to its former complexity and biodiversity. Furthermore, some of the species at risk may decline to the point where they can no longer re-establish in the LSA.
- The ecology of the oil sands region where the Project is taking place has already been adversely affected by human activities. The Project footprint is immediately adjacent to other existing and approved oil sands mines.

[935] Given this analysis and the lack of proposed mitigation measures shown to be effective, the potential inability to reclaim certain habitats to base case conditions, the decline of many migratory bird species in the oil sands region, and effects on migratory birds that are species at risk described herein, the Panel finds significant adverse project effects on some migratory birds, particularly wetland-reliant wildlife species and species at risk.

[936] The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address some of the likely significant adverse effects of the Project, including effects on some migratory birds.

Cumulative Effects

Evidence

[937] Shell predicted that changes in the land cover of the RSA from PIC to application case and the PDC would have a moderate to high adverse environmental consequence on the abundance of wetland-dependent species, namely horned grebe, olive-sided flycatcher, rusty blackbird, and yellow rail. Shell stated that the resilience of populations of these species in the RSA has not been compromised and that high-suitability habitat remains for these species in the RSA.

[938] Shell chose the black-throated green warbler as a KIR that was representative of old-growth forest birds. The black-throated green warbler is used by CEMA's Sustainable Ecosystems Working Group as an environmental indicator for the bird community. Shell

predicted that cumulative effects on the black-throated green warbler are significant and adverse in both the application case and the PDC, given 35 and 41 per cent declines to high and moderate habitat, respectively in the application case, and 44 and 51 per cent declines to high and moderate habitat, respectively in the PDC. Shell also predicted high-magnitude declines in abundance for this species, which would be of high environmental consequence. Shell stated that, therefore, it considered effects on the black-throated green warbler population in the RSA significant and adverse, given that available data suggest that black-throated green warbler populations in Alberta may be declining to extirpation, potentially because increased development in Alberta.

[939] Shell chose the horned grebe to represent waterfowl species. Shell predicted moderate and high consequence to horned grebe habitat given 19 and 26 per cent declines in high-quality habitat, respectively in the application case and the PDC. Shell identified a moderate-magnitude decline in horned grebe abundance in the RSA from the PIC to the application case, and a high-magnitude decline in abundance from the PIC to the PDC. However, Shell did not consider the effects on horned grebe likely to be significant given that resilience of this species in the RSA has not been compromised.

[940] Shell chose yellow rail as a KIR to be a representative of the marsh-bird community and a riparian health indicator. Yellow rail is also a species of special concern under *SARA*. Shell found declines in yellow rail high-quality habitat of 20 and 27 per cent in the application case and PDC, respectively; however, given the amount of remaining high-suitability habitat in the RSA and estimated population trends, Shell concluded that it is unlikely that the resilience of yellow rail populations in the RSA would be compromised to the point where they are no longer self-sustaining and ecologically effective. Shell conducted partial field surveys (not completed because of forest fires) to find yellow rail in 2009, and four individuals were located in fen habitats in the LSA.

[941] Shell found adverse effects on Canada warbler in the RSA in the application case given declines in habitat of 49 and 34 per cent for high- and moderate-quality habitat, respectively. In the PDC, Shell predicted that Canada warbler will have 61 and 45 per cent losses in high- and moderate-quality habitat, respectively in the PDC. Shell stated that the effects of landscape change in the RSA may have contributed incrementally to population declines in Canada warbler. However, Shell concluded that the resilience of populations of this species in the RSA has not been affected; therefore the cumulative effects are considered adverse but not significant.

[942] Shell stated that after reclamation there would be increases in high-suitability habitat for Canada warbler, olive-sided flycatcher, and black-throated green warbler relative to conditions before reclamation given their association with mature forest stands. However, Shell said that the black-throated green warbler could become extirpated in the timeframe of the Project given current declines in Alberta. Shell also predicted decreases in habitat for horned grebe, rusty blackbird, short-eared owl, and yellow rail given the loss of wetlands; however, Shell stated that these species are not limited by habitat in northeastern Alberta, therefore did not expect regional populations to change.

[943] EC stated that several studies and analyses have demonstrated high levels of existing and potential future habitat loss and possible adverse effects on migratory birds in this region. EC stated that it is concerned about the level of habitat loss that Shell has identified both in the

application case and the PDC, specifically for Canada warbler, yellow rail, and rusty blackbird. EC stated that these effects will be long-term and possibly permanent, depending on the success of reclamation and particularly for wetland-dependent species such as the yellow rail.

[944] EC stated that the population-level consequences of cumulative habitat loss in the RSA are unknown for most migratory birds; however, habitat loss can contribute to population declines. In particular, EC noted that populations of many migratory birds are already declining in Alberta, including Canada warbler, common nighthawk, olive-sided flycatcher, and black-throated green warbler.

[945] Shell provided a recent report from the Alberta Biodiversity Monitoring Institute (ABMI) on the status of land birds in Alberta's boreal plains ecozone. The report stated that the status of 74 common land birds (including forest specialists, neotropical migrants, species at risk, and human-associated birds) in the oil sands region was 85 per cent intact relative to undisturbed conditions. Intactness is a measure of how closely the actual abundance of a species compares to the number of individuals expected to be found in an area without human disturbance.

[946] OSEC pointed out that the ABMI report sampling locations, showing areas of 85 per cent intact land bird populations, did not include areas where there was oil sands development. OSEC also stated that the ABMI document does not present a picture of future changes to land birds in the region because it represented only past and current conditions and does not show the potential effects of future development to the region, including the Project and other projects that have been approved but not yet built.

[947] Shell acknowledged that ACFN participants in a 2005 CEMA-sponsored workshop provided some TEK describing the decline of migratory birds in the PAD. ACFN suggested that the decline in migratory bird abundance and changes in migration routes are affecting the spring hunt in the oil sands region and specifically in the PAD. ACFN said that waterfowl serve as a signpost for the health of the PAD and the Athabasca River.

[948] Shell stated that its assessment of baseline conditions indicated no decline in the number of migratory birds in the PAD. Shell mentioned that it did not integrate ACFN's TEK in its EIA because it did not match the baseline data.

[949] ACFN said that intentional disturbance of birds and flyways through use of deterrent cannons on tailings ponds may further adversely impact the current or potential availability of migratory birds for ACFN use in the RSA. ACFN proposed that the following factors could all contribute to the change of migration routes of birds:

- large areas along the Athabasca River that are cleared of vegetation
- large plumes of dust, bad-smelling smoke, and pollution in the air
- large amounts of reflective metal and numerous large, noisy, brightly coloured vehicles constantly moving
- nearly constant noise that increases because of cannons and bird deterrent systems as birds fly overhead

[950] EC stated that the migration routes of birds may be changing and this change could affect the availability of these birds in the PAD. According to EC, the oil sands industry may or may not be contributing to change in the migration routes and to decline of migratory birds in the PAD, as the reasons for the changes in the migration routes are not clear.

[951] The Métis suggested that air pollution generated by the oil sands industry is responsible for changes in the number of birds in the region.

[952] FMMFN #468 also noted declines in abundance of migratory birds.

[953] MCFN stated that migratory birds are culturally important species. MCFN expressed concern about the cumulative effects on the health and sustainability of migratory birds. MCFN members reported changes in migratory bird patterns, particularly with respect to ducks and geese, and overall declines in the availability of migratory birds as a result of oil sands development. MCFN reported that these changes have adversely affected the quantity of birds available for the MCFN spring and fall bird hunt, particularly in the PAD.

Analysis and Findings

[954] The Panel recognizes that Shell found substantial loss of high- or moderate-quality habitat (i.e., more than 20 per cent) for five of seven migratory birds it assessed from the PIC to application case and for six out of seven from the PIC to PDC. Among those species are the KIRs Shell chose to represent old-growth forest birds, marsh birds, and waterfowl. Given the relatively high levels of habitat loss predicted, the Panel is concerned about cumulative effects of habitat loss on these three guilds of migratory birds.

[955] The Panel notes that Shell's primary reason for not indicating significant adverse effects on most species of migratory birds is based on the assumption that there is ample habitat in the RSA. As previously discussed, the Panel does not believe that Shell has provided sufficient evidence to support its view that there is adequate habitat for migratory birds in the RSA, particularly given future planned developments. The Panel also notes that according to EC, many species of migratory birds are already experiencing declines in the oil sands region. Although the Panel recognizes that the recent work of the ABMI indicates a relatively high level of intactness for land birds in the oil sands region, the Panel believes that this document provides only a snapshot of the recent past. It does not reflect projects that have been approved but not yet built, and as such, the future development scenario in the region may lead to changes in this degree of intactness.

[956] The Panel notes that most migratory birds with the greatest loss of habitat (i.e., have more than 20 per cent habitat loss) are also species at risk (rusty blackbird, olive-sided flycatcher, Canada warbler, yellow rail, and horned grebe). The Panel recognizes the requirements under *SARA* to mitigate any effects on species at risk.

[957] The Panel understands the cultural significance of migratory waterfowl to Aboriginal people. The Panel recognizes that Aboriginal people have said that there are considerable declines in waterfowl in the PAD.

[958] The Panel is concerned about substantial predicted declines in horned grebe, a KIR chosen by Shell to represent waterfowl. The Panel agrees with EC that the reasons for changes in the migration routes of waterfowl are not yet understood and that more study is required.

[959] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects on migratory birds.

- The loss of migratory bird habitat in the RSA is **likely**—Shell will clear the Project footprint and there will be substantial habitat lost from other projects in the region. Shell predicted more than 20 per cent habitat loss for five out of seven migratory birds for the application case.
- The magnitude will be **high**—given that hundreds of thousands of hectares of habitat available to migratory birds will be cleared.
- The geographic extent is **regional**—given that population limits of migratory birds extend well beyond the boundary of the RSA, and many species migrate to southern North America and South America.
- The duration is **long-term**—given that the timeframe for much migratory bird habitat (wetlands and old-growth) to return to its former biodiversity and function is more than 80 years, and peatland restoration is still not demonstrated for oil sands projects. In addition, the ability of migratory birds to recover in the RSA will be highly linked to the health of populations in the RSA, and currently evidence suggests some substantial declines in several migratory birds in the oil sands region (e.g., black-throated green warbler, rusty blackbird).
- The effects are potentially **irreversible**—given that there is no evidence that peatlands can be successfully reclaimed and the time to restore of old-growth forests is well beyond 80 years, both of which provide habitat for migratory birds. There is also no evidence in the oil sands region that old-growth forest can be restored to its former complexity and biodiversity. Furthermore, evidence suggests that many species of migratory birds are already declining in the oil sands region (e.g., black-throated green warbler) and may not be able to recover after reclamation.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities, and as such, many species of migratory birds are already undergoing regional declines.

[960] Given this analysis and the lack of proposed mitigation measures shown to be effective, the potential inability to reclaim migratory bird habitat to PIC or base case conditions, the current decline of many migratory bird species in the oil sands region, and effects on migratory birds that are species at risk described herein, the Panel finds significant adverse cumulative effects on some migratory birds, particularly old-growth- and wetland-reliant wildlife species.

[961] The Panel recommends that the Governments of Canada and Alberta, in collaboration with interested Aboriginal groups and stakeholders, initiate a joint effort to determine whether the waterfowl population in the oil sands region has declined and whether migration routes have changed. If results demonstrate that there has been a decline, or if routes have changed, the Panel recommends that the Governments of Canada and Alberta work together to determine the causes.

[962] The Panel recommends that the Government of Canada conduct studies to estimate abundance, density, and carrying capacity of the oil sands region for migratory birds.

EFFECTS ON BIODIVERSITY

Project Effects

Evidence

[963] Shell stated that during construction and operations, environmental consequences for all levels of biodiversity in the LSA would be high. Specifically, Shell predicted that the Project and Phase 1 collectively, would result in a 74 per cent decrease in areas of high biodiversity potential at closure (a loss of 5 810 ha) and a 9 per cent decrease in areas of moderate biodiversity potential (787 ha), primarily as a result of the removal of peatlands and the inability to reclaim it. Shell stated that the following would result from a loss of wetlands:

- a loss of areas high in biodiversity potential
- reductions of rare plants
- reductions in habitat for species such as the rusty blackbird, horned grebe, and yellow rail

Reclamation Plans

[964] Shell stated that it would reclaim many areas as upland habitat consisting of terrestrial vegetation types ranked low for biodiversity potential. Shell concluded that while the reclaimed landscape would support a lower level of biodiversity compared with the predevelopment landscape, the environmental consequences for all levels of biodiversity in the LSA would be moderate at closure.

[965] EC confirmed that upland vegetation communities would have relatively lower biodiversity potential than the current lowland-dominated systems.

[966] Shell presented a plan that would apply planting prescriptions based on aspect, moisture, and nutrient regime created by the landform and watershed design. As part of this plan, Shell committed to provide a diverse range of plant species at the start of reclamation to increase the potential of reclaimed sites to evolve into systems with levels of diversity consistent with the predevelopment state. Shell stated that it expected that vegetation diversity would increase over time through processes of dispersal, vegetation succession, and natural disturbance.

[967] ACFN stated that it was concerned about reclaimed sites being planted with a low number of species compared with the species diversity sampled before disturbance. ACFN was also concerned that natural succession processes will not be set in motion if Shell uses its simple planting prescriptions. ACFN also stated that it did not believe that diversity will return over time through the natural ingress of species and that it was likely that diversity will remain at the level initially reclaimed by Shell.

[968] EC stated that there was a great deal of uncertainty about whether species will recolonize some upland habitats in the long term.

[969] Shell stated that it expected emergent properties such as biodiversity, structural complexity, and microbiotic activity would continue to develop on the reclaimed landscape over time. Shell further stated that it would use reclamation techniques such as woody-debris placement to enhance reclamation diversity and ecosystem function. Shell stated that while its own mines were too young to prove reclamation is effective, other mines in the region have been successful at this.

[970] Shell also presented plans to include large constructed wetlands at closure. OSEC provided evidence from wetland biologists who concluded that the marsh wetlands planned for post-closure leases will not achieve the biodiversity of the preindustrial sites. OSEC was concerned that losses to biodiversity will be greatest where wetlands are lost given that reclaimed wetlands in the region to date are salt marshes low in species diversity compared with the predisturbance peatlands. OSEC also stated that even if reclamation were to succeed in reducing wetland loss by area, the Panel should assume that the biodiversity value of this landscape would be significantly less.

[971] In response to statements by ACFN and OSEC that reclamation does not work and cannot return a landscape to equivalent habitat, Shell stated that the reclamation requirement in Alberta is not to create a landscape that is identical to the predisturbed state but to re-establish a functional landscape that provides equivalent land capability.

Biodiversity Monitoring

[972] ACFN and Fort McKay recommended that the Panel require Shell to provide monitoring that would demonstrate and measure the progress in achieving biodiversity levels equal to predisturbance conditions on terrestrial and wetland reclamation lands, including the use of reclaimed land by wildlife and fish species.

[973] EC recommended that Shell support regional biodiversity monitoring initiatives, such as the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* that includes terrestrial biodiversity monitoring and is expected to be fully implemented by 2015.

[974] Shell confirmed that it supported this joint monitoring program.

Impact to Patterned Fens

[975] Shell stated that a unique lenticular patterned fen is in the north east corner of the LSA and that 101 ha of the fen (16 per cent of the resource) would be directly affected by mine clearing and 541 ha of the fen (84 per cent of the resource) would be affected by drawdown. Shell also predicted that surficial aquifer drawdown as a result of the Project would extend up to 3.5 km west of the boundary of the LSA and that this would affect fens beyond the chosen LSA.

[976] EC stated that the fen had high biodiversity value and that it supported several provincially rare plant species. It recommended that Shell monitor and minimize effects of drawdown on the lenticular patterned fen.

[977] Shell stated that it was not aware of any similar plant communities in the RSA.

Biodiversity Framework under LARP

[978] Shell stated that the biodiversity management framework under *LARP* will provide direction for mitigating biodiversity loss in the oil sands region.

[979] OSEC maintained that no biodiversity or land disturbance standards have yet been developed under *LARP* and that in the absence of those frameworks, *LARP* provides no protection for terrestrial resources in the RSA. First Nations and OSEC said that it may be a significant period of time before the biodiversity management framework is completed and accepted by the Government of Alberta. According to OSEC, *LARP* also failed to provide guidance regarding the thresholds for important considerations such as habitat loss, wildlife abundance, and land disturbance. OSEC recommended that the Project be delayed until the *LARP* biodiversity management framework is produced.

[980] OSEC further noted that the Fort McMurray Athabasca Oil Sands IRP is still the guiding plan for the region and that several of the IRP objectives include enhancing the diversity of habitat and wildlife resources for Aboriginal subsistence. OSEC stated that the CEMA *TEMF* represents the most appropriate guidance for the Panel in determining whether proposed wildlife effects are in the public interest and to inform the broad IRP directive to maintain wildlife habitat.

Conservation Offsets

[981] OSEC recommended that Shell be required to address effects using a mitigation strategy that includes a biodiversity offset strategy for addressing wetland disturbance and loss of old-growth forest. Specifically, OSEC requested that the strategy include the retiring of harvesting rights on public lands at a ratio of 3:1 using accepted models for biodiversity offsets used elsewhere.

[982] Shell disagreed that conservation allowances are required to mitigate the effects of the Project. Shell stated that it would comply with the *LARP* biodiversity management framework when it is finalized.

[983] EC stated that the use of conservation allowances to mitigate direct and indirect habitat loss for species at risk and migratory birds is one option that could be considered. EC further offered to help the province, if invited, to help understand what offsets might apply to preserving biodiversity.

Analysis and Findings

[984] The Panel interprets biodiversity to refer to the totality of genes, species, and ecosystems of a region. Therefore, the effects on biodiversity examined in this section reflect a synopsis of project effects previously described in the Effects on Wetlands, Effects on Old-growth Forests, Effects on Traditional Plant Potential Areas, and Effects on Wildlife and Their Habitat sections. In assessing Project and cumulative effects on biodiversity, the Panel has considered effects at the species, community (ecosystem), and landscape levels.

[985] The Panel recognizes the concerns of OSEC and Aboriginal groups about the potential adverse effects of the Project on biodiversity in the LSA.

[986] The Panel acknowledges that Shell has committed to

- follow the *Guidelines for Reclamation of Terrestrial Vegetation in the Oil Sands Region*,
- comply with the *LARP* biodiversity management framework when issued,
- support the Alberta Biodiversity Monitoring Institute,
- support the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, and
- develop a biodiversity monitoring program to monitor the success of reclamation and establishment of biodiversity for the Project.

[987] The Panel notes that it is difficult to determine how much high-, moderate-, and low-biodiversity potential habitat will be lost as a result of the Project given that Shell provided values for the MRDA and included the areas for both Phase 1 and the Project. However, the Panel believes that there appears to be a high potential for significant loss of biodiversity based on overall wildlife habitat loss, the time lag between disturbance and reclamation, and the unproven methods for reclamation of peatlands and old-growth forest. In particular, the Panel believes that the loss of the lenticular patterned fen in the LSA appears to be a significant issue, given the high biodiversity value of the fen and its rarity in the regional landscape.

[988] The Panel believes that project effects on biodiversity at the local (LSA) level cannot be evaluated without considering the effects of other projects beside or close to the Project. As discussed elsewhere in this report, several large, existing and approved mines are close to or beside to the Project, including Shell's MRM, Syncrude's Aurora North and South Mines, Imperial's KOSP, and FHOSP (yet to be developed). In summary, the Project is nearly surrounded by other large oil sands developments but Shell has not explicitly discussed this as part of the ecological context for the assessment of biodiversity at the local level. The significance of project effects on biodiversity must include consideration of those other projects immediately beside or close to the Project that also contribute to a loss of habitat and biodiversity.

[989] The Panel believes that loss of wildlife habitat and reductions in species abundance resulting from the Project will result in an overall decrease in biodiversity values for the local area, including the LSA. The Panel believes that the lack of mitigation measures proposed by Shell for project effects that have been shown to be effective and the inability to reclaim wetland habitats to their former levels of biodiversity intensifies the issue. Furthermore, the Panel believes that the loss of wildlife habitat and species abundance resulting from other projects immediately beside or close to the Project contribute to the significance of effects on biodiversity at the local level.

[990] The Panel notes that the Project will have a life of about 40 years. After closure and reclamation, it will take at least several decades for natural processes to re-establish levels of biodiversity similar to those found before development. The Panel also believes that there is a level of uncertainty related to reclamation success, including the degree and rate at which species will recolonize and use the reclaimed landscape.

[991] The Panel understands that Alberta intends to establish under *LARP*, by the end of 2013, a biodiversity management framework that will set targets and thresholds for biodiversity

indicators, including vegetation, aquatic components, and wildlife in order to maintain ecosystem function and landscape connectivity. The Panel acknowledges that the pending *LARP* biodiversity management framework represents the Government of Alberta's desire to take a regional approach to managing cumulative effects and implementing standards for biodiversity. While the Panel notes that the biodiversity management framework may include an objective to avoid or mitigate land disturbance to biodiversity, currently no biodiversity standards have been developed under *LARP*.

[992] The Panel understands the concern of OSEC and Aboriginal groups that the proposed biodiversity management framework under *LARP* is not yet available and that in the absence of the proposed framework under *LARP*, Shell should use the current *TEMF*, which provides the most appropriate guidance for managing wildlife resources in the oils sands region, including thresholds for wildlife habitat loss.

[993] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of project effects on biodiversity in the LSA.

- The decrease in high and moderate levels of biodiversity in the LSA is **likely**—the Project footprint will be cleared, and after reclamation landscape levels of biodiversity will not reach similar levels.
- The magnitude will be **high**—given a 5810 ha loss of high biodiversity areas that cannot be reclaimed.
- The geographic extent is **regional**—given that the lenticular fen appears to be unique in the RSA and that effects of drawdown as a result of the Project will extend beyond the LSA.
- The duration is **long-term**—given that the time frame to restore biodiversity to wetlands is greater than 80 years and peatland restoration is still not demonstrated for oil sands projects.
- The effects are **irreversible in the medium- to long-term**—given that it appears that levels of biodiversity will not return to base case levels or have the same suite of species or ecosystems without a significant time lag (about 80 years). There is also no evidence from the oil sands region to suggest that reclaimed ecosystems can return to their former preindustrial complexity and biodiversity.
- The ecology of the oil sands region where the Project is taking place has already been adversely affected by human activities, and some habitats may be particularly fragile given the inability of it to be reclaimed (e.g., lenticular fen). The Project footprint is immediately beside to other existing and approved oil sands mines.

[994] Given this analysis and the lack of proposed mitigation measures for habitat loss that have been demonstrated to be effective, the inability to reclaim certain habitat types to pre-development biodiversity levels, the long lag time between disturbance and restoration of biodiversity levels, and the effects on wildlife, vegetation, and wetlands described elsewhere in this document, the Panel finds a significant adverse effect on biodiversity in the LSA.

[995] As discussed in previous sections of this report, the Panel is concerned about the lack of mitigation shown to be effective proposed for loss of wildlife habitat in the LSA, particularly for

migratory birds that are wetland-reliant or species at risk. The Panel believes that without additional mitigation, significant adverse effects on species abundance and diversity will occur. The Panel believes that these adverse project effects will contribute to adverse effects on biodiversity as well. Although the Panel recognizes that *LARP* and other regulations and policies of the Government of Alberta do not currently mandate the use of conservation offsets in the oil sands region, given that few options are available for avoiding or minimizing the adverse effects of large surface mines, the Panel believes that conservation offsets may need to be considered.

[996] The Panel has already recommended that before any other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets. When considering the need for conservation offsets, the Panel recommends the Governments of Canada and Alberta also consider the need to preserve the suite of species and ecosystems in the region and to maintain local and regional biodiversity. The Governments of Canada and Alberta should also consider the need to preserve unique environments and species such as those found in the lenticular fen.

[997] The Panel recommends that ESRD ensure that, in addition to using commercially available vegetation, Shell initially be required to plant more species and implement measures such as seed collection, direct seeding, and planting stock from cuttings or seed, instead of relying more heavily on the natural ingress of species to return biodiversity to reclaimed landscapes.

[998] The Panel notes that Shell will be subject to the *LARP* biodiversity management framework when it is released. The Panel recommends to ESRD that Shell be required to develop a biodiversity monitoring program and report progress and program results as part of its closure and reclamation annual report. In order to protect biodiversity, the Panel expects Shell to modify its mitigation strategies based on the findings of the program.

[999] The Panel recommends that the Government of Alberta work toward timely completion of the *LARP* biodiversity management framework, including a reporting and monitoring structure to ensure that relevant parties such as Shell are in compliance.

Cumulative Effects

Evidence

[1000] Shell stated that during construction and operations in the application case, at an ecosystem level, high-biodiversity potential areas would decrease by 78 223 ha (14 per cent of the resource within the RSA) compared with the PIC. Shell noted that in the base case, 65 128 ha of high-biodiversity habitat had already been lost (12 per cent of the resource). Given the loss of non-treed wetlands and treed fens that cannot be reclaimed, the decrease in high-biodiversity potential areas would be 71 884 ha (13 per cent) at closure compared with PIC. Likewise, moderate-biodiversity potential areas would decrease compared with the PIC by 129 179 ha (15 per cent of the resource within the RSA) during construction and operations. Shell noted that at base case, there was a loss of 119 534 ha of moderate-quality biodiversity potential compared with the PIC (14 per cent of resource). At closure there would be a net decrease in moderate-biodiversity potential areas of 14 per cent (121 297 ha). Shell indicated that the only moderate-ranked land cover class that would increase at closure relative to PIC is water. Only low-biodiversity potential areas would increase relative to the PIC (22 per cent), largely as a result of cut blocks and disturbance areas. At closure, Shell ranked ecosystem effects as having a negative, moderate environmental consequence.

[1001] Shell said that given the increased level of disturbance in the application case since the PIC, the potential for permanent change in ecosystem function as a consequence of regional development exists, yet Shell stated that a biodiversity management framework (i.e., *LARP*) for the Lower Athabasca that might define acceptable effect thresholds is currently not available. Shell concluded that it is unlikely that an unacceptable threshold has been reached for ecosystem-level biodiversity in the RSA given the areal extent of the resource remaining. Therefore, according to Shell, it did not consider the change in ecosystem-level biodiversity from PIC to the application case a likely significant adverse effect.

[1002] OSEC stated that in the absence of the *LARP* biodiversity management framework, Shell should have relied on existing guidance in the IRP and the *TEMF* to assess significance of effects on wildlife (see Effects on Wildlife and Their Habitat).

[1003] Shell indicated that at a landscape level, there would be a net decrease of 147 191 ha (19 per cent) of terrestrial land covers in the RSA from PIC to application case at closure. All terrestrial land cover types would decrease in the area except for coniferous jackpine-black spruce. There would also be a net decrease of 119 532 ha (12 per cent) of wetlands in the RSA over the same period, and the largest decrease would occur because of the removal of treed fens. Disturbed landscapes would show the greatest increase from PIC to application case closure, changing from 1621 ha to 288 497 ha. Shell stated that at both the ecosystem and landscape level, a large portion of effects on biodiversity from the PIC to the application case are due to changes that have already occurred from PIC to base case (e.g., 154 814 ha, and 109 254 ha of habitat of terrestrial and wetland habitats, respectively were already lost in the base case).

[1004] At closure, Shell ranked species effects as having a negative, moderate environmental consequence. Shell stated that it considered that species-level biodiversity from PIC to application case would not be significantly and adversely affected because it was unlikely that the resilience of plant and wildlife populations in the RSA would be compromised to the point that they were no longer self-sustaining and ecologically effective.

[1005] OSEC viewed residual adverse effects on biodiversity in the RSA for the application case as significant for species-, ecosystem-, and landscape-level effects.

[1006] OSEC stated that the *TEMF* provides recommendations for managing wildlife in the oil sands region and more specifically the RMWB. According to *TEMF*, the key environmental management objective for the RMWB is to maintain wildlife indicators within 10 per cent below the lower limit of the NRV. According to OSEC, rates of habitat loss of more than 20 per cent would surpass this threshold, and using this rationale, 9 out of 19 species would have habitat losses exceeding the threshold under the application case. Therefore, losses of more than 20 per cent of high- and moderate-biodiversity potential would surpass this threshold.

[1007] At an ecosystem level, Shell stated that before reclamation, high-biodiversity potential areas would decrease by 116 987 ha in the RSA (22 per cent of the resource within the RSA) as a result of the PDC. After reclamation, there would be an overall net decrease in high biodiversity potential of 55 073 ha (10 per cent of the resource), largely as a result of being unable to reclaim treed fens. However, Shell stated that at closure there would be a slight increase in non-treed wetlands given inclusion of shrub lands and littoral zone into this category. Similarly, Shell stated that areas of moderate biodiversity potential before reclamation at the PDC would decrease by 173 845 ha (21 per cent of the resource) compared with the PIC. After reclamation, there would be an overall net decrease in moderate biodiversity potential areas of 28 038 ha (3 per cent of the resource), with the greatest loss being to treed bog and poor fen. There would be a net increase of 83 830 ha (9 per cent of the resource) in low-ranked areas of biodiversity potential in the PDC after reclamation.

[1008] At a landscape level, Shell predicted that there would be a negative residual effect on both wetlands and old-growth forests resulting in a low environmental consequence in the PDC compared with the PIC. Although Shell determined that the environmental consequence of species-level effects was high, Shell concluded that effects on all three levels of biodiversity (species, ecosystem, and landscape) within the RSA due to the PDC would not be significant. As with the application case, Shell based this conclusion on the following assumptions:

- the resilience of plant and wildlife populations in the RSA will not be compromised to the point where they are no longer self-sustaining and ecologically effective; and
- it is unlikely that an unacceptable threshold has been reached for ecosystem-level biodiversity in the RSA given the areal extent of the remaining resource.

[1009] OSEC stated that given the growing list of proposed oil sands projects and modelling of future forestry and fire disturbances, the latest EA predictions from Shell now show higher levels of cumulative effects on wildlife and biodiversity at the regional level than in any oil sands assessment previously tabled. For example, OSEC pointed out that under Shell's modelling, 11 out of 19 species at risk and KIRs will have habitat losses greater than 20 per cent under the PDC scenario and would therefore surpass the threshold given in the *TEMF*. OSEC also noted that Shell's PDC underestimates future development in the RSA given that it does not include all reasonably foreseeable disturbances such as mandatory exploration on oil sands leases.

[1010] OSEC also said that the significant effects Shell identified in its updated assessment are consistent with those identified by the Government of Alberta in scenario modelling conducted as part of the Lower Athabasca regional planning process. This report shows that under a base case scenario where mitigation is not improved or proposed oil sands mining developments are not slowed, a 50 per cent loss in biodiversity indicators is projected.

[1011] Fort McKay stated that biodiversity is critical because it reflects the integrity of the landscape and ecosystems that support traditional activities. Lands ranked with high biodiversity potential have decreased in the *Fort McKay Specific Assessment* area (40 Township) by 26 per cent between 1960 and 2007, suggesting cumulative effects already exist. The *Fort McKay Specific Assessment* further indicated that the principal stressor adversely affecting biodiversity is land disturbance.

[1012] ACFN stated that Shell's assessment of the cumulative effects of multiple projects on wildlife was inadequate. ACFN was concerned that Shell's impact assessment relied on the belief that effects on wildlife and vegetation will be reversible but that Shell provided no substantive evidence to support this. Further, ACFN indicated that Shell did not intend to verify its predictions in the field for biodiversity, rendering its analysis largely theoretical and not useful for understanding effects on biodiversity.

[1013] EC shared the same concerns as those expressed by Aboriginal groups about the potential cumulative environmental effects of oil sands development in northern Alberta on biodiversity.

Analysis and Findings

[1014] The Panel noted previously that the methods Shell used for estimating land-cover type in the RSA are subject to an error of ±20–25 per cent due to the coarse nature of Landsat imagery. The Panel notes that Shell's analysis of cumulative effects is based on assumptions of biodiversity potential linked to areas of specific land-cover type as determined by Landsat imagery, and that this level of uncertainty likely translates into Shell's estimates of areas of high, moderate, and low-biodiversity potential. The Panel therefore believes that Shell's predictions of changes in biodiversity potential at operations and closure should be considered to be somewhat uncertain, with ±20–25 per cent error.

[1015] The Panel acknowledges that from PIC to the application case, 14 per cent of areas of high and 15 per cent of areas of moderate-biodiversity potential will be lost before reclamation. After reclamation, this will decrease to 13 and 14 per cent of the high- and moderate-resource areas in the RSA, respectively. Similarly, the Panel recognizes that from PIC to PDC, 22 and 21 per cent of these high and moderate biodiversity potential areas respectively will be lost before reclamation. After reclamation, this loss will be only 10 and 3 per cent of the high- and moderate-resource areas in the RSA, respectively.

[1016] The Panel notes that Shell has not provided the rationale indicating how reclamation to within 6 per cent of preindustrial levels of areas of high and moderate biodiversity will be achieved at PDC closure. The Panel notes that Shell may be reclaiming to equivalent land capability; however, the Panel understands that this does not necessarily provide for equal levels of biodiversity (i.e., the same species and ecosystems), particularly given Shell's intended use of unproven methods for reclaiming peatlands, and the time lags in reclaiming of old-growth forests. Similarly, the Panel is uncertain how Shell was able to predict reclamation of high biodiversity potential ecosystems in the PDC that are greater than high biodiversity potential after reclamation in the application case. Furthermore, given that Shell chose not to quantitatively predict wildlife habitat availability after reclamation of the PDC (see the Effects on Wildlife and Their Habitat section) and given the uncertainty of the future reclamation plans of other oil sands projects, it is unclear to the Panel why or how Shell chose to take this approach for biodiversity following reclamation in the PDC. The Panel therefore finds that there is a high degree of uncertainty about Shell's predicted biodiversity potential of ecosystems following reclamation of the PDC.

[1017] The Panel notes that Shell categorized water as having "moderate biodiversity potential," and therefore an increase in water equates to an increase in moderate biodiversity potential. The Panel understands that in Shell's analysis, the large increase in water is due to the addition of pit lakes to the closure landscape. The evidence presented indicates that there is uncertainty about the viability of aquatic ecosystems in EPLs (see the Use of End Pit Lakes section). The Panel therefore believes that Shell's predictions for areas of moderate biodiversity potential after closure may be overestimated by the inclusion of water in EPLs.

[1018] The Panel emphasizes that in accordance with the *Convention on Biological Diversity* (*CBD*), to which Canada is a signatory, an integral part of preserving biodiversity is preventing or reversing the decline of at-risk or rare species. *SARA* is Canada's realization of this commitment under the *CBD*. Thus, in order to fully assess effects on biodiversity, the Panel needs to carefully consider the effects on species at risk.

[1019] The Panel believes that Shell did not assess effects on species at risk in its analyses of effects on biodiversity, and as such, Shell has not entirely captured the effects (project or cumulative) on biodiversity in its EIA. The Panel also recognizes that Shell has based its analysis of biodiversity on an unverified assumption that habitat types (e.g., wetlands,) have an associated level of biodiversity. The Panel, therefore, believes that there is substantial uncertainty about Shell's predictions of biodiversity in the RSA. The Panel points to the Effects on Wildlife and Their Habitat section, which indicates that in the application case, three species at risk (Canada warbler, wood bison, and woodland caribou) will lose more than 20 per cent high- or moderate-quality habitat, while another four will lose between 17 and 19 per cent high- or moderate-quality habitat (rusty blackbird, western toad, horned grebe, and yellow rail). In the PDC, eight species at risk will lose more than 20 per cent high- or moderate-quality habitat, with upwards of 40 per cent in the case of the woodland caribou and Canada warbler.

[1020] The Panel believes that there is a high potential for significant cumulative effects on biodiversity in the RSA based on Shell's biodiversity analysis and on predicted habitat loss for species at risk. Unproven methods for reclamation of peatlands, time lags in restoring old-growth forests, and lack of other mitigation which has been shown to be effective also support this conclusion. In particular, the Panel notes that the cumulative loss of peatlands (e.g., treed fens) in the RSA appears to be significant given their high biodiversity value.

[1021] The Panel believes that the application case will result in a loss of substantial areas of high and moderate biodiversity potential compared with the PIC (15 per cent ± 20 per cent error). After closure, reclamation will reduce the loss of these areas by only 1 per cent, largely due to the prevalence in the RSA of wetlands that cannot be reclaimed.

[1022] The Panel believes that the PDC scenario presented in Shell's EIA is the most detailed assessment of the future of northeastern Alberta's oil sands region presented in an EIA so far. Rates of loss for areas of high- and moderate-biodiversity are upwards of 20 per cent (±20 per cent error) at or above some suggested or recommended thresholds for wildlife habitat loss. It is also important to note that these predicted losses occur across an RSA that is approximately 2 200 000 ha in size (22 000 km^2). The loss of biodiversity will be significantly higher in some areas of the RSA, such as the area surrounding the Project. The Panel acknowledges that there are many uncertainties associated with potential future development projects, with reclamation plans, and with the level of biodiversity that can be restored to reclaimed landscapes; however, the Panel is of the view that the precautionary principle dictates that given the predicted loss of biodiversity within the RSA, significant management actions are required in the very near term to avoid widespread and unacceptably high losses of biodiversity.

[1023] Based on the criteria provided in the Agency's guide, *Determining Whether a Project is Likely to Cause Significant Environmental Effects* (November 1994), the Panel used the following approach to determine the significance of cumulative effects based on the application case and the PDC.

- The decrease in high and moderate levels of biodiversity in the RSA is **likely**—the footprint of the Project combined with other projects will be cleared, and after reclamation landscape levels of biodiversity will not reach similar levels.

- The magnitude will be **high**— given a loss of combined high and moderate biodiversity areas of 193 181 ha and a 83 111 ha, respectively that will not be restored to PIC levels of biodiversity in the application case and PDC.
- The geographic extent is **regional**—affecting the RSA.
- The duration is **long term**—given that the timeframe to restore biodiversity to wetlands and old-growth forests is more than 80 years and peatland restoration is still not demonstrated for oil sands projects.
- The effects are **largely irreversible**—given that it appears that levels of biodiversity in areas that were mined will not return to PIC levels in the medium to long term (i.e., at least 80 years) or have the same suite of species or ecosystems. Furthermore, some high-biodiversity habitat types will be completely lost (e.g., peatlands); therefore the associated biodiversity cannot be expected to return.
- The ecological context of the oil sands region where the Project is taking place has already been adversely affected by human activities. Moreover, areas of the RSA (e.g., the lenticular patterned fen) have been classified as being particularly sensitive and unique to the area.

[1024] Given the predicted declines in biodiversity in the RSA, the degree of error associated with Shell's estimates, the loss of habitat for species at risk, the uncertainty associated with habitat reclamation, and the lack of mitigation shown to be effective, the Panel finds a significant adverse effect to biodiversity in the RSA as a result of the cumulative effects of the application case and the PDC compared with the PIC. Despite uncertainty around appropriate thresholds to be used, the Panel believes that cumulative effects on wildlife in both the application case and the PDC in the Project area have exceeded or are approaching some of the proposed thresholds, resulting in significant adverse effects on biodiversity.

[1025] The Panel acknowledges the potential role of *LARP* and the pending biodiversity management framework in providing a more regional approach to managing cumulative effects in the oil sands region. The Panel recognizes that cumulative effects in the oil sands region cannot be managed on an individual project basis and that they require collaboration and strategic planning across government, industry, Aboriginal peoples, and nongovernmental organizations.

[1026] The Panel recognizes that the best mitigation for maintaining high levels of biodiversity in the RSA would be to avoid the removal and drawdown of peatlands wherever feasible. However, given that few options are available for avoiding or minimizing these effects without sterilizing bitumen resources, the Panel believes that conservation offsets should be considered as recommended elsewhere.

RECLAMATION

Evidence

[1027] Shell presented a plan to disturb 20 555 ha of land as a result of the Project and stated that reclamation was its primary mitigation measure. Shell stated that its reclamation goal is a maintenance-free, self-sustaining ecosystem with a capability equal to pre-development conditions, noting that this did not mean areas would be identical to predisturbance conditions.

[1028] ACFN stated that it was uncertain that the area would be reclaimed to an equivalent land capability as Shell has no track record of successful reclamation to date.

[1029] OSEC stated that reclamation to a landscape of equivalent capability is not possible because of the loss of fens and the inability to reclaim peatlands.

[1030] In response, Shell stated that there is evidence that oil sands developments can be reclaimed, specifically noting that Syncrude's Gateway Hill and Suncor's Wapiskaw Lookout are comprised of mixed forest and wetland reclamation in a former tailings disposal area.

[1031] Shell stated that due to the characteristics of oil sands mining operations, most reclamation would take place in the final 15 years before closure, between 2045 and 2060. Shell stated that it would use progressive reclamation practices and outlined several techniques to reclaim land as soon as possible, including

- constructing overburden dumps from the outside to the middle to reclaim the outer portions earlier,
- contouring landforms and placing reclamation material shortly after overburden structures reach maximum capacity,
- constructing drainage channels and wetlands areas when landforms are completed to promote progressive closure drainage conditions, and
- capping tailings cells soon after trafficable surfaces are achieved.

[1032] Shell also stated that working with the Oil Sands Tailings Consortium (OSTC) to advance tailings management would lead to more timely reclamation.

[1033] ACFN expressed concerns about the timelines proposed for reclamation by Shell and the uncertainty of success. ACFN recommended that the Panel require Shell to reclaim project lands progressively and effectively to a standard and in a timeframe consistent with the exercise of ACFN's treaty rights.

[1034] OSEC stated that much of the reclamation would take place during the later stages of mine life and therefore questioned Shell's commitment to progressive reclamation.

[1035] Shell stated that due to its proposed reclamation timeline, it would stockpile most reclamation material before placement. Shell committed to use direct placement techniques when the opportunity exists. Shell provided evidence that sufficient reclamation material, and sufficient area to store that material within the proposed boundary, was available and that suitable planning had occurred. Shell committed to follow the *Field Guide to Ecosites of Northern Alberta* for soil salvage and the *Guidelines for Reclamation to Forest Vegetation in the Athabasca Oil Sands Region* for soil placement.

[1036] Shell initially proposed that benches would remain as part of the closure landscape and that Shell expected no issues with terraces. However, during the hearing, Shell committed to remove all benches as part of the recontouring process before reclamation material placement.

Analysis and Findings

[1037] The Panel acknowledges ACFN's and OSEC's concerns about reclamation and equivalent land capability. The Panel notes that the parties have differing views on equivalent land capability. According to Alberta's *Conservation and Reclamation Regulation*, equivalent land capability means: "the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed before an activity being conducted on the land, but that the individual land uses will not necessarily be identical".

[1038] The Panel notes that as a result of oil sands mining operations, including overburden storage areas and pit mining, the reclaimed landscape will predominantly comprise upland habitat and open water with less lowland area than the predisturbance landscape. The Panel concludes that while this may result in different land uses after reclamation than presently exists, the reclaimed landscape as proposed by Shell will have a similar ability as the pre-development landscape to support varying variety of land uses. The Panel expects Shell to adaptively manage and modify its closure and reclamation plans throughout mine life to ensure that it achieves equivalent land capability.

[1039] The Panel acknowledges OSEC's and Aboriginal groups' concerns related to progressive reclamation. The Panel notes that *LARP* encourages timely and progressive reclamation and states that Alberta's new progressive reclamation strategy includes a suite of initiatives to improve clarity, security, and environmental performance, including an enhanced reclamation certificate program, a transparent reporting system, and a new progressive reclamation security policy.

[1040] The Panel understands that due to the operational methods of oil sands mining, regardless of the measures outlined above, there will be limited opportunities for progressive reclamation until later in the life of the mine. The Panel expects Shell to reclaim disturbed land as soon as suitable areas become available in order to minimize the area under disturbance at any given time.

[1041] While the Panel acknowledges that the amount of material that can be directly placed may be limited because most reclamation occurs in the final years of the Project, the Panel recommends to ESRD that Shell be required to apply direct placement techniques when ever an opportunity exists in order to help the process of regeneration and to minimize double handling of material. Based on the evidence presented, the Panel expects Shell to salvage and store a sufficient volume of material to be used for reclamation where direct placement cannot be applied.

[1042] The Panel acknowledges Shell's commitment to remove benching as part of the reclamation process. The Panel expects Shell to design landforms according to the CEMA *Landscape Design Checklist* and ESRD's report *Designing Oil Sands Mining Landforms for Natural Appearance and Integration Across Boundaries*. The Panel expects that reclaimed landforms will replicate natural features and blend into the surrounding landscape. The Panel requires Shell to remove all benching on mine discard structures before final reclamation.

[1043] The Panel requires that Shell provide, for AER approval, a detailed watershed design report for all mine structures one year before the final placement of reclamation material.

HUMAN HEALTH

Evidence

[1044] Shell assessed human health effects that may occur through several exposure pathways, including air and dust inhalation, soil ingestion, drinking water, local fruit, vegetable, fish and wild game consumption, and dermal contact with soil. It assessed effects through acute, chronic, and multiple pathways exposure. Shell determined that acute inhalation contaminants exceeded health-based guidelines for acrolein, $PM_{2.5}$, the "eye irritants" mixture, and the "respiratory tract irritants" mixture. The chronic inhalation assessment determined that exceedance may occur for acrolein and the "nasal irritants" mixture. Shell also determined that for multiple-pathway exposure, exceedance may occur for methyl mercury, molybdenum, the "neurotoxicants" mixture, and the "reproductive and developmental toxicants" mixture.

[1045] Shell stated that the Project would result in zero to negligible increases in these compounds and that exceedances are a result of existing exceedances in the base case. Shell noted that the only exception was molybdenum which would increase substantially between the base and application cases. Shell noted that increased exposure risk was a result of fish consumption by residents and that its human health risk assessment (HHRA) incorporated enough conservatism that it did not anticipate health effects.

[1046] With respect to exposure to carcinogenic compounds, Shell predicted that the incremental lifetime cancer risk resulting from the Project would be essentially negligible as exceedances were the result of base case emissions, but it noted a lifetime cancer risk above the regulatory benchmark for some chemicals. Shell stated that there is no defined acceptable cancer incidence rate for the exposure to carcinogens associated with baseline conditions.

[1047] Shell conducted a semiquantitative assessment of potential risks associated with naphthenic acids in EPLs. This assessment indicated that predicted naphthenic acid concentrations would exceed the typical range of background values; however, volatilization would not be an important fate process in these cases. Shell was unable to complete a human health risk assessment of these compounds because health-based exposure limits were not available. Without detailed toxicity information, Shell stated that it was difficult to ascertain the likelihood and severity of adverse health effects of exposure to naphthenic acids. Shell committed to continued monitoring during operations and after closure to verify its predictions for naphthenic acids concentrations in the end pit lakes.

[1048] HC participated in the review of the HHRA and subsequent updates provided by Shell. HC requested additional information to inform its review of the potential human health implications of the Project. It did not note any remaining concerns about the completeness or methodology used by Shell in its 2007 HHRA. HC asked for minor clarifications to address discrepancies between the 2007 and updated 2012 HHRA.

[1049] Shell noted that none of the several studies completed on health effects in the oil sands region demonstrated that adverse health effects were caused by oil sands development. Shell noted that additional health-related studies and programs are planned for several communities that should provide more information about human health. Completed and planned studies and programs include:

- Community Exposure and Health Effects Assessment Program (AHW 2000),
- Human Exposure Monitoring Program, Alberta Cancer Board (2009),
- Air Quality Health Index Program (WBEA and ESRD),
- Contaminant Load Study (ESRD), and
- Additional studies with Fort McKay and Fort Chipewyan.

[1050] Shell also noted that oil sands proponents are collecting more baseline data as part of their HHRAs and that they are making an effort to pool these data sets and look at cumulative health effects on a regional basis.

Air Quality

[1051] Shell conducted air dispersion modelling to predict the maximum annual average air concentrations for each of the identified locations at which people were known or expected to spend time on a long-term basis. Shell noted that it combined measured average indoor air concentrations with the predicted ground-level air concentrations in recognition of the fact that people spend most of their time indoors. Shell noted that in almost all cases, predicted chemical-of-potential-concern air concentrations were less than the health-based guidelines, therefore it considered health risks for these compounds low. Exceptions included acrolein, $PM_{2.5}$, the "eye irritants" mixture, and the "respiratory tract irritants" mixture. Shell noted that it did not anticipate health effects as a result of these exceedances because they were either the result of base case emissions or would not manifest in health effects. Shell stated that its HHRA was sufficiently conservative that exceedances may be exaggerated. Shell's chronic inhalation assessment determined that exceedances may result in increased health risks for acrolein and the "nasal irritants" mixture. Shell reiterated that exceedances would not result in health effects and that it had incorporated a high degree of conservatism into the development of the chronic inhalation exposure limit.

[1052] ACFN stated that rates of asthma in the Fort Chipewyan community are increasing and hypothesized that the poor air quality as a result of the oil sands industry was a contributing factor. Fort McKay also stated that the effects of industrial air emissions on air quality and health are a major concern and that odours, in particular are an important issue. Fort McKay stated that efforts are needed to reduce odourous emissions and noted that many of the management measures to be adopted by Shell would reduce emissions of odourous substances. Fort McKay recommended a detailed monitoring and notification protocol if detectable odours result.

Water Quality

[1053] In its assessment, Shell assumed that cabin residents get 100 per cent of their drinking water from local surface water bodies. It also assumed that Aboriginal residents, including all permanent First Nations and Métis and subsistence residents of Anzac, Clearwater, Conklin, Descherme Lake, Fort Chipewyan, Fort McKay, Fort McMurray, Javier/Chard, La Loche, Namur River, and Poplar Point have access to a municipal water supply. Shell stated that it did not expect that municipal water quality would change from the measured background concentrations in the application case or PDC. As a result, it predicted no changes in the concentrations of chemicals of potential concern for Aboriginal residents, community residents, and workers.

[1054] For cabin residents, Shell noted that it attributed increases in health risk associated with exposure to molybdenum and arsenic through ingestion of drinking water to base case emissions. Shell stated that the exceedance for molybdenum was still below the upper limit imposed by HC and would not result in adverse health effects. Similarly, Shell noted that studies completed in North America have shown no association between arsenic levels in drinking water and the occurrence of cancer. With respect to naphthenic acids, Shell stated that it was difficult to ascertain or quantify health effects associated with exposure to naphthenic acids because drinking water or health-based guidelines for human exposure to them were not available.

[1055] Shell stated that it is committed to maintaining water quality in the area by capturing runoff, using mitigation measures for seepage, and using collection wells. Shell stated that with the implementation of mitigation measures, water quality will return to baseline conditions around 15 years after closure.

[1056] All Aboriginal groups expressed concern about drinking-water quality and stated that they no longer drink surface water because of perceived contamination. MCFN recommended that Canada and Alberta expand the testing parameters for drinking water at Fort Chipewyan to include PAHs and toxic metals using a methodology capable of measuring at threshold levels that are related to human health.

[1057] ACFN noted that the PAD is susceptible to alluvial sedimentation of fine particles contaminated by the oil sands industry and related development. OSEC cited a Water Monitoring Data Review Committee report which noted that levels of PAHs in sediments of the PAD and mercury in the eggs of birds nesting there have been increasing, and that levels of arsenic in the sediments of Lake Athabasca have also been increasing. In addition, Dr. Schindler, on behalf of OSEC, noted that his studies indicated chemicals such as mercury, other trace metals, and PAHs are getting into the river system. ACFN expressed concerns that these chemicals and sediments are causing higher rates of cancers and other ailments, such as lupus in Fort Chipewyan. As a result, Dr. Schindler suggested that human health studies be completed in order to assess the claims about ingestion of cancer-causing chemicals. However, Dr. Schindler also noted that his study showed that the current dissolved load of contaminants is not a concern for the community of Fort Chipewyan due to its distance from oil sands projects.

[1058] Shell responded that according to conclusions of the Hall et al study, natural sources comprise most PAH deposition in the PAD, and that deposition has not increased in recent decades despite an increase in oil sands development.

Contamination of Country Foods

[1059] Through its multiple pathways assessment, Shell evaluated health effects of contamination of country foods. The multiple-pathways exposure assessment focussed on those chemicals of potential concern released into surface water and emitted into the air by the project with the potential to persist or accumulate in the environment. Shell determined that ingestion of country food (i.e., fish, wild game, local root vegetables, and local fruits) may result in increased health risk due to increased exposure from methyl mercury, molybdenum, and arsenic. Shell stated that all elevated health risk exposures related to consumption of country foods were present in the base case and not attributable to the Project. In the case of arsenic, Shell noted that the incremental lifetime cancer risk values from base case to application case were essentially negligible.

[1060] Shell stated that proponents are faced with challenges of data collection for wild game and must rely on other studies to provide data on which to base predictions about project effects. Shell said that it used concentrations from other studies to supplement its sampling program and stated that the models used based on this data have demonstrated a strong ability to predict effects. In referencing data sources, Shell noted that a traditional food study completed in the early 2000son country food contamination in communities potentially affected by the Project is outdated. Shell stated that one food-quality study was conducted for the Chipewyan Prairie Dene First Nation in 2006, and follow-up work had been completed more recently. Shell noted that this study looked at chemical concentrations in small and large game and fish and that some of this data was still relevant for the communities in the area of the Project. Shell also pointed out that Alberta Health and Wellness studied arsenic concentrations in moose in 2007 and that the Terrestrial Environmental Effects Program has been working with Fort McKay to develop a berry-monitoring program.

[1061] ACFN and NSFMFM stated that their members do not feel comfortable harvesting country foods in the Project area, partly because of fear of contaminants and altered taste and form. In particular, ACFN noted that members avoid harvesting fish from the Athabasca River because of perceived contamination and deformities in fish. ACFN and NSFMFM reported reduced harvesting success, high cost of store-bought goods, dietary issues associated with poor selection of traditional foods available for harvest, reduced nutritional quality because of contamination, and fear of ingesting contaminated country foods. Both OSEC and ACFN expressed concern about potential contamination of traditional food and water and the associated psychological stress it can cause.

[1062] Shell stated that although it is difficult to assess perception issues through a health risk assessment, it was committed to addressing ongoing ambient monitoring and psychosocial effects through public consultation and information, and to providing results to stakeholders during Project operations and closure.

[1063] In addition to concerns expressed about elevated health risks in Fort Chipewyan, ACFN expressed frustration that community health studies were not a higher priority for Alberta and Canada and that promised studies had not been completed.

[1064] MCFN recommended that Canada conduct a traditional food study with MCFN participation to examine the impact of oil sands contaminants on traditional foods such as fish, moose, caribou, small game, bird eggs, and berries in the region. It noted that special attention should be drawn to the location of traditional foods in relation to oil sands mine development. MCFN and ACFN also recommended that Alberta and Canada conduct a comprehensive baseline study for Fort Chipewyan residents as recommended in the *EUB Decision 2004-009* for the Shell JPM project, including a study of contaminant intake and body burden for Fort Chipewyan band members. MCFN also recommended that Canada and Alberta fund additional research on health, diet, practice of treaty and Aboriginal rights, and contaminant avoidance patterns.

[1065] Shell submitted a report by the Royal Society of Canada on health concerns in the oil sands area. The report evaluated the potential health risks of exposure to mercury and increased cancer risk from exposure to arsenic and PAH. It stated that increased mercury in fish tissue was not unique to the oil sands region and data suggest that fish contamination across northern Canada is occurring from a generalized source. The report also stated that evidence does not support arsenic or PAH exposure as an explanation for concerns about excess cancer in the region. The report does note, however, that local concerns about cancer risk suggest that a rigorous risk assessment be done in the region.

Analysis and Findings

[1066] The Panel notes that while HC asked Shell to provide some clarification on certain issues in Shell's HHRA, it did not raise any significant issues related to the completeness or methodology of the HHRA. Similarly, the Panel notes that the Government of Alberta, by letter dated October 14, 2010, stated that the information requirements of the EIA terms of reference had been met and that there was enough information to understand the Project at a conceptual level. The Panel finds that Shell's methodology and analysis in its HHRA is appropriate, and therefore, the Panel believes that it can rely on Shell's HHRA.

[1067] The Panel believes that exceedances related to the Project's release of $PM_{2.5}$, the "eye irritants" mixture, and the "respiratory tract irritants" mixture are the result of conservative estimates and believes that the Project will not appreciably contribute to the level of these emissions in the region. However, the Panel believes that contributions to exceedances that are present in the base case may contribute to an increased risk for health effects due to cumulative effects. The Panel believes that the *LARP* air quality management framework provides an appropriate mechanism for managing emissions to avoid exceedances and associated health effects.

[1068] The Panel understands that Alberta is currently working on ambient air quality objectives for acrolein and that Shell said it would comply with these. The Panel recognizes that because the "eye irritants" mixture and "respiratory tract irritants" mixture contain a high proportion of acrolein, these objectives will help limit exceedances of these mixtures. The Panel believes that monitoring and mitigating acrolein, and as a result, the "respiratory tract irritants" mixture, may alleviate Fort McKay's concern about odourous effects.

[1069] The Panel notes there is a gap in knowledge about contamination of country foods. The recent work by Dr. Schindler and EC on atmospheric deposition seems to indicate that the concerns raised by Aboriginal groups about country food contamination are not unfounded. The Panel acknowledges that conducting health studies is a slow process, but stresses the importance of integrating health studies at the provincial and federal levels to better inform health risk assessments. The Panel also believes that studies examining contamination of country foods are important and should be a focus of health studies conducted by Alberta or Canada. These studies should provide effective analysis of human health because of impacts from potential environmental effects of the oil sands industry, including water quality and impacts related to fish contamination, any potential impacts on air quality, contamination of wild game, and contamination of traditionally harvested plants used as food or medicine. The Panel recommends that Alberta Health and Wellness and HC complete a regional baseline health study focused on First Nations, Métis, and other Aboriginal groups that considers all relevant health factors, including environmental exposures and potential exposure pathways, such as water, air, and consumption of traditional foods. The Panel notes that a similar recommendation was made in the Joint Review report approving Phase 1 in early 2004 (*EUB Decision 2004-009*)

[1070] The Panel discussed the issues related to mercury and water contaminants and provided recommendations in the No Net Loss Plan section and the End Pit Lake section that should be adhered to by Shell in order to ensure that fish are not consumed by humans in times of elevated contaminants. Recommendations in those sections will also be important as they relate to discharge of water from the EPLs. Provided that Shell implements mitigation measures to inform users of the health risks associated with the consumption of fish in the short term, the Panel expects no significant adverse effects on human health from the Project.

[1071] The Panel recommends that the Governments of Canada and Alberta, in collaboration with Aboriginal groups, monitor the occurrence and rate of aerial deposition of contaminants on traditional plants to determine the extent of regional effects on plant quality.

[1072] The Panel notes that *ERCB Decision 2011-005* recommended that the federal and provincial governments work with the CCME to develop specific water quality objectives for naphthenic acids. The Panel is disappointed that recommendations from previous review panels stating that human and aquatic health guidelines need to be developed for naphthenic acids have not yet been carried out. The Panel again recommends that the Governments of Canada and Alberta work with the CCME to develop specific water quality objectives for naphthenic acids.

[1073] The Panel notes that the Royal Society of Canada report provides some clarity regarding conflicting studies on health effects in the oil sands region. The Panel understands that the report determined that health effects experienced by residents of the oil sands region are not unique to that region and are likely not the result of oil sands operations. However, the Panel agrees with the report's suggestion that a rigorous risk assessment be done in the region to assuage concerns about cancer risk.

[1074] While the Panel finds that the incremental lifetime cancer risk associated with the Project will not result in a significant increase in cancer incidence, the Panel cannot determine the acceptability of the potential lifetime cancer risk from a public health perspective using a conventional approach because an acceptable "benchmark" cancer risk level for exposure to background levels of carcinogens is not available for comparison.

PHYSICAL AND CULTURAL HERITAGE RESOURCES

Evidence

[1075] Shell evaluated the effects of the Project on archaeological and paleontological resources by conducting a historical resources impact assessment (HRIA) in accordance with the Alberta *Historical Resources Act* and the *Guidelines for Archaeological Permit Holders in Alberta* in 2005, 2006, and 2007. Shell stated that historical resources included pre-contact archaeological resources, sites, artifacts, structures, and documents that relate to the Euro-Canadian occupation of the region, and resources relating to post-contact use of the landscape by Aboriginal people.

Shell stated that paleontological resources consist of physical remains that represent evidence of extinct multicellular plants and animals that inhabited the region in precontact times.

[1076] Shell's assessment included a review of existing historical information and field investigations for the first 10 years of operations as directed by Alberta Culture. Shell indicated that it would conduct another historical resources assessment for the following 10 years of development using the previously completed assessment as a baseline.

[1077] Shell recorded six historical sites within the Project footprint. Shell stated that additional sites may be identified in the follow-up study. It believed that all of the sites represented precontact use of the area. Shell recommended to Alberta Culture that stage 1 mitigation[12] be conducted at one site and that no further work was needed for the remaining sites. Shell stated that it discovered no paleontological resources during the HRIA.

[1078] Shell proposed additional mitigation measures for any sites found during operations, including avoidance, education, and periodic monitoring. Shell predicted that assuming that Alberta Culture established appropriate and effective mitigation strategies and that Shell adhered to them, there would be negligible direct effects. Shell also stated that it would mitigate any impacts on paleontological finds uncovered during operations in accordance with the *Historical Resources Act*.

[1079] Shell noted that it recorded 1 174 historical resource sites within the historical resources RSA have been recorded. Shell stated that about 53 per cent of these sites have been or will be affected by existing, approved, and planned developments in the oil sands region.

[1080] NSFMFM and the Clearwater Band stated that there are likely undiscovered mass gravesites containing ancestors of those groups, possibly at Poplar Point, Fort McKay, and Fort Hills. NSFMFM also raised concerns about Pierre-au-Calumet, Quarry of the Ancestors, and the Cree Burn Lake sites.

Analysis and Findings

[1081] The Agency's *Reference Guide on Physical and Cultural Heritage Resources* acknowledges that there are two aspects of cultural heritage: tangible and intangible. The Panel notes that the HRIA focused on the tangible aspects. The Province of Alberta has also recognized the importance of assessing disturbance to tangible sites of Aboriginal heritage and archaeological resources. Information on intangible aspects of culture is provided in the Aboriginal Traditional Land Use, Rights, and Culture section of this report.

[1082] The Panel understands that the NSFMFM and Clearwater Band's mass graves are probably not within the footprint of the Project and will not be affected by the Project. The Panel also notes that other sites referenced by the NSFMFM are also not located in the Project footprint. The Panel recognizes that these locations may be affected in the future by other oil sands developments, but it is confident that concerns will be dealt with appropriately through provincial legislative requirements.

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[12] Stage 1 Mitigation is background study and property inspection. A stage 2 assessment is required after areas of archaeological potential have been identified.

[1083] The Panel believes that the completion and submission of the HRIA for the Project and the follow-up activities Shell has completed and plans to complete to meet the requirements of Alberta Culture under the *Historical Resources Act* will mitigate the Project's potential effects on historical and cultural resources. The Panel therefore finds that there are no significant project effects.

SOCIAL AND ECONOMIC EFFECTS

Project Effects

Project Benefits

Evidence

[1084] Shell stated that the Project will provide significant economic benefits to the region, the province, and the country.

[1085] Shell stated that it expected construction would take place between 2015 and 2018, with first oil expected in 2018. Shell said that the Project will result in the recovery of some 325 Mm^3 of dry bitumen over its approximately 40-year life.

[1086] Shell stated that the capital cost will be \$8–\$12 billion over the 3.5-year construction period. The Alberta economy will receive \$4–\$6 billion of total construction expenditures. Of this, \$265–\$400 million dollars will accrue to regional companies and workers.

[1087] Shell expected the effect of the Project construction on provincial gross domestic product (GDP) to be an increase of \$7–\$10 billion.

[1088] Shell said that the Project will provide 9310 work years of on-site employment peaking at 4400 workers in Q1 of 2018. There will also be 3100 work years of off-site employment in Alberta. The Project will also create 750 full-time operational jobs.

[1089] RMWB can expect to receive \$23–\$34 million annually in property taxes at current rates. Federal and provincial government royalties and taxes will total \$17 billion over the Project life.

Analysis and Findings

[1090] On the basis of the evidence, the Panel finds that the Project will result in significant direct and indirect economic benefits to the region, the province, and Canada in terms of bitumen recovery, employment, royalties, and taxes. The Panel also notes the letter of support for the Project from the RMWB.

[1091] The Project will have an incremental adverse effect on some ecological aspects; however, the Panel still believes the Project is in the public interest, in part due to the significant economic benefits for the region, Alberta, and Canada.

Methodology

Evidence

[1092] ACFN raised concerns about the methodology Shell used for its socioeconomic impact assessment (SEIA). It submitted that Shell did not link sociocultural indicators to its assessment of impacts on the exercise of Aboriginal and treaty rights. ACFN also submitted that the methodologies in project-specific impact assessments were inadequate for assessing the relationships among socio-cultural and ecological aspects that support the practice of rights. It stated that the applications do not assess socioeconomic issues on the basis of rights but instead tend to address issues as if the First Nations (such as the trappers) were merely stakeholders with no constitutionally protected rights other than commercial rights. This impacts their TLU, rights, and culture, and is more fully addressed in the Effects on Aboriginal Traditional Land Use, Rights, and Culture section.

[1093] Shell said that the Project SEIA met the TOR set by ESRD and provided detail and analysis comparable to that previously accepted by regulators in past oil sands mining applications.

Analysis and Findings

[1094] The Panel accepts that project-specific EIA requirements can be improved. Currently, the socioeconomic impacts of developments are addressed in only a general and qualitative manner. The Panel addresses these methodological concerns in the Effects on Aboriginal Traditional Land Use, Rights and Culture section.

Housing

Evidence

[1095] Shell estimated temporary construction-related housing demand of 430 dwellings during 2015–2018 for construction workers and indirect/induced workforce, in addition to the camps. Shell also stated that the RMWB will be able to absorb the additional housing needs. Shell estimated that 1230 dwellings will be needed for operations staff 15–18 months before operations. Shell estimated that the overlap of construction and operations housing will be in 2016–2017. Shell proposed to mitigate housing impacts by using camps.

[1096] Shell will house 90 per cent of the construction workers in camps on site. In the event that it is unable to do so, Shell assured the Panel that it could arrange accommodation with regional commercial providers of camps. It expected the remaining 10 per cent of construction workers would live in the community.

[1097] The RMWB said that it had entered into a memorandum of understanding (MOU) with Shell that addresses the housing impacts to RMWB's satisfaction. Shell stated it will strongly encourage its operational workers to permanently reside in the region.

Analysis and Findings

[1098] The Panel acknowledges that Shell and the RMWB have entered into a MOU that address the Project's housing impacts. The Panel therefore accepts Shell's assessment that the RMWB will be able to absorb the additional housing needs.

[1099] The Panel finds that camp accommodation is a viable and necessary option for Project construction given existing labour and housing constraints. The Panel also finds that Shell's on-site construction camp and MOU with the RMWB are appropriate mitigation. The Panel acknowledges that Shell will encourage operations workers to reside in the community as a result of its MOU with RMWB.

Transportation Infrastructure

Evidence

[1100] Shell estimated that project-related traffic would peak in 2017 at between 640 and 780 vehicles per day as average daily two-way traffic (ADTT) volume.

[1101] Shell had originally expected project-related traffic on Highway 63 north of Fort McMurray to the turnoff into the MRM to average between 470 and 575 AADT over 2012–2015 but did not provide an update to reflect the adjusted timeline for construction of the Project. Shell stated that it did not believe the changes to the schedule would not have a substantial effect on its assessment. Current traffic volumes along Highway 63 north of Fort McMurray and south of the MRM turnoff vary between 3000 and 19 400 AADT. Shell stated that it expected those volumes to increase when more projects begin construction.

[1102] Shell said that project-related traffic along Highway 63 during the construction period will likely consist of

- 36–51 per cent private vehicles, such as cars, pickup trucks, and vans, including company-owned and contractor vehicles;
- 49–64 per cent trucks, including both regular and oversized; and
- less than 1 per cent buses, primarily transporting workers residing in the region to and from the Project site during shift rotations.

[1103] Shell will bus Fort McMurray-based operations workers on a daily basis to mitigate the Project's impact on the regional transportation infrastructure.

[1104] RMWB, OSEC, and ACFN said that traffic was a major concern. RMWB stated that it was not the amount of traffic but the type of traffic that causes problems.

[1105] Shell stated that higher traffic volumes will increase chances of accidents. Shell said that it would use the Fort McKay industrial park on the east side of the Athabasca River for staging.

[1106] The RMWB stated that traffic congestion on Highway 63, particularly in the Fort McMurray urban centre, was causing serious safety issues and delays. It also agreed that about 25 per cent of all oil sands employees were using a bus service to travel to the major plant sites.

[1107] Shell would use its aerodrome during Project construction to transport out-of-town construction workers. 90 per cent of the construction workers will be using the aerodrome and will be subsequently bussed to the site. Shell expected only a few consultants to use the Fort McMurray airport. During Phase 1's peak construction period, Shell had 16 aircraft landings per week, between two and three a day, depending on the day of the week. The planes moved about 2000 passengers per week. Shell expected a similar number for the Project.

Analysis and Findings

[1108] While it is clear that traffic is a concern, the Panel finds that mitigations provided by Shell to reduce the Project's traffic impacts are comparable to efforts used by oil sands companies to mitigate traffic impact that have been shown to be effective. The Panel expects Shell to follow through with its proposed mitigations and to inform RMWB if it is unable to do so. Regional impacts and recommendations for regional traffic issues are discussed in the Regional Transportation Infrastructure section.

Quality of Life and Social Services

Evidence

[1109] Shell stated that the Project will be responsible for about 7.5 per cent of the population growth in the region over the next 10 years.

[1110] Shell acknowledged that health care service providers in the region face several challenges, including difficulty recruiting and retaining health care professionals and the need for additional regional health infrastructure. Shell expected the construction workforce of the Project to contribute to impacts on the health system, especially on emergency room services, in the 2012 to 2015 period. It did not update its estimate to reflect the changed timeline for the Project. To mitigate impacts of its operations on regional health services, Shell committed to the following.

- Establishing an on-site health care facility for primary emergency and occupational health service at all times. Shell said that it was considering expanding its existing on-site health care facility at the Albian Sands village to serve the enlarged JPM workforce, and building a similar facility at the PRM site. On-site medical facilities will provide primary care for on-site workers and manage minor health issues and injury incidents without drawing on local health services provided by Alberta Health Services. It expected these facilities would reduce the number of people from outside the region who use emergency-room services in Fort McMurray.

- Continuing to contribute financially to the Northern Lights Health Foundation, where appropriate, including contributing $1.2 million to the Inner City Health Initiative.

- Working with other companies to address the cumulative socioeconomic effects of their projects on the region. This included ongoing discussions with Alberta Health Services about medical infrastructure and service needs and how companies might contribute to addressing those needs.

[1111] Shell stated that the Project will not be a sizeable driver of demand for education services. Shell forecasted population increases under its base case assumption of an additional 2600 school-aged children in the 2007 to 2010 period. In the application case, the impact is about 1180 and 780 school-aged children in 2015 and 2020, respectively. Shell has already voluntarily taken steps to address issues related to the regional education system, including:

- providing ongoing support for e-learning in Fort McKay;
- supporting other Aboriginal education initiatives identified by schools in Fort Chipewyan, Fort McKay, and Fort McMurray;
- supporting Keyano College financially, including funding to open a new campus in Fort Chipewyan;
- supporting Aboriginal scholarships;
- bringing science and technology camps and workshops to Fort Chipewyan and Fort McKay through Actua;
- delivering drilling-rig and driver training in Fort Chipewyan;
- sponsoring delivery of the Building Environmental Aboriginal Human Resources Program in Fort Chipewyan; and
- implementing environmental monitoring programs and training to allow local workers to take advantage of job opportunities available in the oil sands industry.

[1112] RMWB testified that six new schools are required to adequately service the existing needs. RMWB also stated that many of the workers who come to the region do not take up "permanent residence" and thus do not pay taxes to the region or to the province but nevertheless create demands upon those governments for health care and other services. As a result, these services do not get properly funded because many of the people who use them are not contributing tax payments toward the costs of operating them.

[1113] ACFN testified that its education budget was spent and is the only program in which the community falls into a deficit year-over-year. ACFN continues the program because it knows that education is fundamental and foundational for future generations.

Analysis and Findings

[1114] The Panel notes that although Shell did not update certain of its estimates to reflect changing timelines for the Project, this is not a significant concern because the changes do not affect Shell's assessment of the impacts or the mitigation that Shell selected. The Panel acknowledges that projections such as these are difficult to make, and Shell provided an estimate based on available information and its judgment. Shell also testified that the region can absorb the additional workers.

[1115] It appears to the Panel that it would be of significant assistance to RMWB and Alberta to obtain better information about the numbers of people moving to the region, particularly those residing in work camps. The Panel believes that it ought to be possible to obtain information that will enable better planning and delivery of services that may currently be under strain. As an example, the Panel believes that the municipal and provincial approval processes for the work camps should provide a high level of information about this transient population. The Panel also expects that the oil sands companies and other business operators should be able to provide actual information about their respective work forces.

[1116] The Panel agrees that health care service providers in the region face many challenges. The Panel acknowledges that it is the province's responsibility to ensure that appropriate standards of care and service levels are maintained, and it is Shell's responsibility to mitigate only the Project impacts. Shell stated that it is committed to reducing the Project's impact on health services by having an on-site facility. The Panel accepts Shell's commitment and believes that this is an appropriate mitigation for the effects of the Project. The Panel expects that Shell will inform the RMWB about the progress of that facility's development and about any delays that may impact the hospitals and other medical facilities in the RMWB.

[1117] The Panel acknowledges that although education is the province's responsibility, Shell has made numerous efforts to support the advancement of education and training locally. The Panel hopes that industry will continue such efforts. The Panel also recognizes the need for First Nations and Métis people to have access to education so that their members can improve their skills.

Cumulative Effects

Socioeconomic Impact Assessment and Cumulative Impacts

[1118] RMWB said that it has undergone transformative changes largely because of oil sands development. However, in the RMWB's opinion, research on project-specific and cumulative socioeconomic impacts is lacking. According to RMWB, ESRD has indicated that it is not adequately resourced to review the information provided. In RMWB's view, this results in an ineffective and inefficient assessment of socioeconomic issues facing the region. The RMWB would like to see a more coordinated approach that includes both senior levels of government, RMWB, and industry so that regional/cumulative socioeconomic impacts can be identified, mitigated, and monitored. It believes that further work needs to be done, given the unique nature of the regional resources and their impact.

[1119] Shell indicated that since RMWB and other regional service providers began raising socioeconomic concerns at regulatory hearings in 2006, the province has contributed $3.6 million over three years to provide strategic municipal planning support to the region. The province has also provided $103 million in direct funding in addition to a $136 million four-year interest-free loan to build a replacement sewage-treatment facility and an upgraded water treatment plant in Fort McMurray. Since 2007, the Government of Alberta has committed $2.25 billion to infrastructure and services in the RMWB, and the RMWB has also invested in major infrastructure developments, including RCMP detachment buildings and regional fire halls. The province has contributed

- $30 million to support the lower town-site water collection system upgrader;
- $15 million for regional landfill development;
- $33.4 million for the Keyano Sports and Wellness Centre;

- $54 million for the Wood Buffalo Housing and Development Corporation;
- $10 million plus land for the construction of the south cell block and station; and
- $52 million for Phase I of the new RCMP detachment in Timberlea.

[1120] Shell stated that while the region may be experiencing rapid growth and its accompanying pressures, it is also experiencing unprecedented tax-base growth. Property assessment in the rural service area of RMWB, which consists mostly of oil sands facilities, grew by an average of 24 per cent per year, from under $6 billion in 2005 to more than $24 billion, in 2011.

Land Release

Evidence

[1121] The RMWB provided evidence that showed that compared with other cities in Alberta and Canada, Fort McMurray had one of the highest average multiple listing service (MLS) sales price for houses by a wide margin, second only to Vancouver. These high costs combined with recent changes in mortgage insurance and lending were making it even more difficult to become a homeowner, especially in the urban services area. Rental rates for a two-bedroom apartment in Fort McMurray were nearly double those in Edmonton, Calgary, and Toronto. And even though house prices in Vancouver were higher than in Fort McMurray, rental rates in Fort McMurray were nearly 70 per cent higher than in Vancouver. These high rental rates made it very difficult for low- and moderate-income households to find affordable housing that meets their needs.

[1122] The RMWB calculated housing affordability, which is measured by comparing the cost of housing with the household income. The greater the share of income required to pay for housing, the less affordable is the accommodation. The main impact of high rental rates is on lower- and moderate-income households that have to spend well over 30 per cent of their income to obtain housing, according to RMWB estimates.

[1123] The severe shortages and the high cost of rental housing have created ideal conditions for the emergence of a secondary rental market. This secondary rental market includes non-traditional housing markets, such as renting a room, sharing accommodation, renting an illegal suite, couch surfing, and even long-term residency at a campground. Accommodations in the secondary rental market often do not comply with safety codes, and the owners of these accommodations do not want the RMWB to learn of them because they would be closed by the RMWB. The RMWB knows this market is much larger than it appears. However, the RMWB acknowledges that this market has some benefits, including the following:

- it provides a good source of affordable housing
- it helps some property owners pay their mortgages
- it provides housing for the workforce in areas, such as the service sector

[1124] Shell agreed that the effect of high housing prices was felt more acutely by lower-income people in Fort McMurray. ACFN stated that its members also need more housing. When young members of ACFN leave the reserve to work in the city and are unable to find affordable housing, they are forced to return. ACFN stated that the housing shortage on their First Nation's land is also a serious problem. There are too few houses on reserve and no land is available to build more houses. In some cases there are as many as 12 family members staying in one house. ACFN acknowledged that there have been improvements in housing availability in recent years.

[1125] In final argument, counsel for NSFMFM and Clearwater Band stated that housing prices have especially affected the Aboriginal population and, in particular, the elderly among that population who are unable to afford to rent or own in Fort McMurray or the surrounding areas. The high cost of living has rendered many Aboriginal people, including members of these groups, homeless or at imminent risk of becoming homeless.

[1126] Shell stated that since 2007, the Government of Alberta has invested more than $50 million in affordable housing in the region. The provincial government has also made a commitment of $241 million to develop lands in the Parsons Creek and Saline Creek Plateau areas. Of significance is the signing of an MOU between the province and the RMWB for the creation of an urban development subregion, which will enable the RMWB to keep pace with the demand for residential, commercial, industrial, and institutional land. RMWB indicated that it did not have a date or a final commitment from the province as to when the urban development subregion will be created.

[1127] RMWB testified that most cities have a 5- to 20-year supply of land in the hands of the private sector to ensure development keeps pace with community growth. RMWB presently has no land bank which has posed many problems for the RMWB and hampered development. It stated that land was currently very expensive and not available for suburban use. It also stressed that it needed large quantities of land on the market right now for industrial and commercial development to support development in the southern part of the region.

[1128] RMWB said that the population increase from oil sands activity has created a huge demand for housing. A key component of housing is land. When land is not released, it becomes scarce and, therefore, more expensive. The longer it takes to get land for development released, the more scarce it becomes and, in turn, the more inflated the price becomes. RMWB stated that the province then values the land at this elevated market value and will not sell or release land until current appraisal values are met. RMWB believes that, in effect, the province's lack of a coherent and functioning land-release strategy has caused or largely contributed to the largest component of escalating housing costs—land.

[1129] RMWB also explained that land was often put on the market by the province without the infrastructure to support development, which causes delays in development and increases housing costs further.

[1130] RMWB believed that in order to have a true free market for land in Fort McMurray, it needs to have a modest surplus of land to start to regularize prices. RMWB emphasized that an effective land release policy was needed at the heart of a more sustainable housing picture in Fort McMurray. RMWB requires a long-term supply of accessible land with major infrastructure installed thereby creating a functioning free marketplace which will stabilize land supply and prevent land shortages and price escalation. If this does not happen, the challenges associated with housing affordability will continue and the region will continue to experience housing price shocks until this issue of long-term supply is addressed. RMWB said that it is planning to develop 40 000 residential, commercial, and retail opportunities in the only free-market land currently available, which is in the downtown area.

[1131] RMWB requested that the Panel strongly urge the Government of Alberta to develop and implement a coherent, effective, and sensible land-release policy that takes into consideration the unique issues in RMWB. This policy should include servicing, access, and valuation of land that reflects these unique issues. The RMWB also expressed frustration over the apparent inability of successive provincial government departments to understand and respond effectively to the needs of the regional municipality.

[1132] The RMWB also made it clear that bringing land on the market without adequate road access does not and will not solve the housing issue. When land is released, it needs to be accessible. According to the RMWB, there has been a lack of coordination between ESRD and Alberta Transportation on land release and land access. While some progress has been made in releasing more land, there are still significant challenges in making the bulk of released land accessible to enable residential development. The Parsons Creek neighbourhood, which could house 20 000 or more residents, depends entirely on the completion of the Parson's Creek interchange before it can go beyond 1000 residents. The province has moved the completion date of that interchange back another year, so the neighbourhood will not be ready for the second phase of development until 2015. Another example is Saline Creek, which without some further improvements to the transportation access at the current Highway 69/63 interchange, can only be developed to roughly 50 per cent of its capacity to house 16 000 residents.

Analysis and Findings

[1133] The Panel accepts that purchasing and renting housing in the RMWB is very expensive. The Panel is also of the view that secondary housing, while it may have benefits, also has many drawbacks. The Panel recognizes that the high housing costs can be mitigated in part by increasing the supply of land and housing.

[1134] The Panel is of the view that the lack of developable land is a problem for the RMWB. The Panel supports the RMWB's request for better coordination on this issue between the Government of Alberta and the RMWB. The Panel also recommends that the Government of Alberta provide to the RMWB a timeline for land release. Furthermore, the land release should take into account land for infrastructure so that development of the land can proceed effectively. The Panel believes that when making land valuations, the Government of Alberta should consider the unique situation that the RMWB is in, that is, that the market is inflated in the municipality.

[1135] The Panel accepts that it is difficult to proceed with residential development in the RMWB without proper access. Accordingly, the Panel finds that better coordination among RMWB, ESRD, and Alberta Transportation is needed to ensure that proper and timely access to development land is provided. The Panel urges RMWB, ESRD, and Alberta Transportation to begin a process that will ensure appropriate coordination.

Regional Transportation Infrastructure

Evidence

[1136] The RMWB confirmed that Highway 63 could absorb additional traffic, including that created by the Project.

[1137] The RMWB indicated that a committee established in the previous 18 months, including representatives of provincial government departments, RMWB, industry, Northern Alberta Development Council, and others, recommended to the province an eastern bypass route to divert traffic on Highway 63 around Fort McMurray to the east. RMWB emphasized that the proposed bypass was needed to take pressure off Highway 63 through Fort McMurray.

[1138] The bypass would reduce construction and oil sands operations traffic on Highway 63 in the Fort McMurray urban service area and also allow heavy trucks to move south and connect with the railhead for bitumen shipping by rail.

[1139] The RMWB said that Alberta Transportation had advised RMWB that once it built the bypass, it would rededicate Highway 63 through the urban service area as an urban highway. This would allow residents to move more freely around the urban service area.

[1140] The RMWB said that the bypass project has been discussed by the committee but that a plan has not been finalized by the committee and there is no funding for it.

[1141] The RMWB said that it proposed to the province that it discuss with industry an alternative funding model so this bypass can be built, but currently there was no initiative for this discussion to take place.

[1142] The RMWB emphasized that efficient transportation has not been investigated in a coordinated way. It noted that there were more than 40 airports in the region, resulting in safety issues, impacts to minable land, and problems for air traffic controllers.

[1143] The RMWB also acknowledged that it had tremendous support from the oil sands industry, including Shell, in designing bus lanes through the community to get buses in and out of Fort McMurray to the sites faster. With respect to both land-release and transportation, the RMWB asserted that the province needs to establish more integrated approaches.

[1144] ACFN members noted that traffic increases on the Fort Chipewyan winter road and Highway 63 due to oil sands traffic were reducing public safety. ACFN also submitted that access to and from Fort McMurray via the winter road is becoming more dangerous as traffic increases, and black ice is becoming more common.

Analysis and Findings

[1145] The Panel notes that there appears to be a lack of coordination between the two levels of government with respect to infrastructure planning. This is having a negative impact on the development of essential infrastructure in the region. If left unaddressed, the lack of coordination will continue to affect development in the region and hinder progress on those issues.

[1146] The Panel believes that it is essential for ESRD and Alberta Transportation to work together to ensure that when land is released for development, it includes road access. The Panel believes that if they do not work in a coordinated fashion, some of the housing issues in the region that need to be addressed will persist. This is also discussed in the above section on land release.

[1147] The Panel agrees that Highway 63 is congested and that the proposed bypass would alleviate some of the traffic concerns. Although RMWB provided no information about the cost of it, considering the entities that were represented on the committee that recommended it to the provincial government, the Panel is persuaded that the proposed bypass is a viable option.

[1148] The Panel believes that Alberta Transportation, RMWB, and the industry should work in a collaboratively on developing of the eastern bypass route. Highway 63 is expected to be twinned south of Fort McMurray; however, issues relating to Highway 63 through and north of Fort McMurray also need to be addressed by the regional stakeholders.

Project Accommodations/Work Camps

Evidence

[1149] RMWB submitted that the work camps already in place could accommodate well over 70 000 people. The RMWB was also aware of additional permits and applications that would bring the potential camp population to in excess of 80 000. RMWB asserted that camps are only a short-term solution and that in the long run, fly-in/fly-out operations have a negative impact on the community. Camps can have, and often do have, turnover well in excess of 40 per cent. Generally, RMWB would prefer to have workers live within the community. The RMWB also noted that many fly-in/fly-out workers earn their money in Alberta but pay their taxes to their home provinces.

[1150] Shell agreed with the RMWB on this point and stated it would commit to secure local workers for the Project or will strongly suggest that its operations workers relocate to the region.

[1151] The RMWB said that the preliminary results from the 2012 municipal census indicated that work-camp occupancy is 39 271 people, a 411 per cent increase in occupancy over the last seven years. In 2010, RMWB believed that about 24 000 people lived in work camps in the region. During inspections in 2011, the RMWB's planning and development team found 21 unpermitted camps accounting for an additional 12 000 beds. According to the RMWB, the likelihood was that the 70 000 currently existing work camp spaces are 70–80 per cent occupied during the winter high season, much higher than the self-reported 52 per cent.

[1152] The RMWB accepted that camps make sense for construction phases of projects, and the RMWB was not against all camps. The RMWB was concerned that ESRD issues the permits but does not monitor whether the camps are safe and complying with provincial regulations. This results in the RMWB being obligated to enforce not only its own regulations, but also provincial regulations. In some cases, work camps continue to function after permits have expired. RMWB is also concerned about the risk of forest fires to remote work camps and their residents. For many camps, workers are living in stacked trailers, and there is only a single access road.

[1153] The RMWB testified that ESRD approves camps without input from the RMWB. According to the RMWB, the camps are spread over a vast region, are not coordinated, the transportation to and from them is insufficient, and residents have a poor quality of life. RMWB was also concerned that ESRD does not advise the RMWB when a lease for a camp has been issued. ESRD also does not require a developer to prove that it has obtained a municipal development permit to construct and operate a camp. From the RMWB's perspective, if a camp does not have a municipal permit, it is unpermitted. The RMWB was aware of instances in which operators have received a lease from the province and have assumed, deliberately or accidentally, that the lease was sufficient for the operator to proceed to build its camp without obtaining a development permit from the RMWB. When the operator does not apply for a municipal permit, the RMWB is unaware of it and cannot ensure compliance with safety regulations. The RMWB needs to know where populations are located for fire suppression and emergency response. In 2012, the RMWB found 28 existing camps that were not permitted. RMWB also indicated there are cases of permitted but noncompliant camps, usually involving the numbers of residents exceeding the permitted capacity.

[1154] The RMWB suggested management steps to help with permitting. It asked that the Panel recommend to the Government of Alberta that the responsible departments work more closely with RMWB to advise on work-camp applications.

[1155] The RMWB asked the Panel to recommend to Alberta and Canada that they identify, assess, and monitor the impacts of fly-in/fly-out workforce models on host communities. The RMWB specifically requested that the Panel find on the evidence presented in this hearing that fly-in/fly-out operations have a negative impact on the region.

[1156] ACFN expressed real concern about the quality of life of ACFN members working in camp environments. While the wages are good, the work and living conditions at camp are not well liked.

Analysis and Findings

[1157] The Panel accepts that fly in/fly out work forces may have a negative impact on the region. However, the Panel also recognizes that the lack of available workers and housing in the region makes fly-in/fly-out work forces a viable option for companies, particularly during the construction phase.

[1158] The Panel believes that without proper authorization and enforcement, work camps can be a problem in the region. The Panel recognizes the issues articulated by RMWB that stem from lack of proper permitting and monitoring of work camps. The Panel recommends to ESRD and the RMWB that they devise a process to make each other aware when either receives a request for camp authorization. It also appears to the Panel that ESRD and the RMWB need to carry out some communication and education programs with camp operators and the companies who use the camps, to ensure that they understand that both entities need regulatory approvals. ESRD and RMWB both need to ensure that camps comply with provincial and municipal regulations and permit conditions.

Quality of Life and Social Services

Evidence

[1159] The RMWB stated that high quality of life is important for any region to develop and attract residents. High costs of living, lack of health and education facilities, and lack of retail opportunities deter new development and make an area less desirable to live in.

[1160] The RMWB estimated that the total population of RMWB was 116 403 people in 2012, including both permanent and nonpermanent residents. It expected the regional permanent, nonpermanent, and project accommodation population to exceed 230 000 by 2030, with Fort McMurray having a population of about 200 000. The RMWB estimated that the total population for 2012 was composed of about 40 per cent nonpermanent residents, a significant increase over 2001, which was estimated at 25 per cent. Nonpermanent portions of the population reside in work camps and within the urban services area of Fort McMurray. OSEC agreed with RMWB that the population would increase to 230 000 by 2030.

[1161] The RMWB presented a series of studies prepared by the Province of Alberta that analyze the cost of a basket of goods and services across various communities in Alberta. It found that when considering all commodities, including shelter, the average cost of living has been 10–15 per cent higher in RMWB over the last decade than in other cities in the province. Most of this difference, in terms of prices in Fort McMurray, was attributable to shelter.

[1162] Shell acknowledged that health care service providers in the region face many challenges, including difficulty recruiting and retaining health care professionals, and the need for additional regional health infrastructure. ACFN stated that the Northern Lights Hospital was built to sustain a regional population of 40 000 people but currently 100 000 to 110 000 depend on it. Shell stated that recent measures to help with challenges affecting health services in the region included:

- an additional $177 million in funding to the Northern Lights Health Region between 2007 and 2010 to address regional health-related growth pressures;
- more doctors recruited to the area;
- more funding to address health-related growth pressures;
- reduced emergency department wait times;
- investments in regional health infrastructure, including
  - two new community health centres,
  - renovations to the ambulatory and emergency departments of the Northern Lights Regional Health Centre, and
  - a commitment to add 100 continuing-care spaces in Fort McMurray.

[1163] To address health-related community concerns in Fort McKay, the Government of Alberta recently signed a letter of intent to develop a comprehensive community health assessment for Fort McKay. The study is to involve the Fort McKay First Nation, Fort McKay Métis Community, Alberta Health and Wellness, and Alberta Aboriginal Relations working together to identify community health issues, health-care priorities, and the design and delivery of new programs to address those priorities. The provincial government and First Nations have also discussed a similar study in Fort Chipewyan, although no agreement has yet been reached.

[1164] The health care and social services' quotient calculated by the RMWB indicated that the demand for these services far exceeds their potential supply locally, which means people have to find those services elsewhere or their need will not be met. The RMWB pointed out that in the event that someone has to be flown out by helicopter from one of the sites for medical reasons, the landing pad is at Number 1 Fire Hall, not at the hospital. The medics must load patients into an ambulance and then drive him/her to the hospital. RMWB says this is primarily because the province has not committed to rebuilding the landing pad at the hospital.

[1165] Shell noted the following information about investments that the province has made to improve health care services in the region.

- In response to the Radke Report, the Government of Alberta committed an additional $177 million between 2007 and 2010 to "address health-related growth pressures" in the region.
- Since 2006, the provincial government has announced plans for and moved forward with several infrastructure improvements to the Northern Lights Regional Health Centre, including
    - renovation of the ambulatory and emergency departments ($6.0 million);
    - replacement of sewer line and domestic hot-water circulation piping ($4.5 million);
    - renovation of the intensive care unit ($2.0 million); and
    - renovations to the hospital's pediatric unit, including more rooms, new beds, new equipment, and a new nursing station.
- The Government of Alberta has also provided funding and planning is underway for two new community health centres in the Fort McMurray communities of Thickwood and Timberlea ($28.2 million, in planning phase) to improve residents' access to primary care services.
- The province has also been moving forward with plans to build a new long-term care facility in Fort McMurray, helping to relieve bed pressures at the Northern Lights Regional Health Centre.

[1166] The RMWB calculated the retail quotient for the RMWB by using 2006 data for selected communities. The retail quotient for the RMWB is significantly less than parity and is well below the retail quotient for the other comparable municipalities included in this analysis. This indicates that the availability of retail services within the RMWB is well below what is demanded. Currently, the RMWB has about one-third of the retail services that it needs. The lack of a pool of potential retail workers in the community is one of the major challenges, made worse by having a part of the regional work force not resident in the community. The RMWB plans to construct new buildings that will provide additional retail and office space, particularly targeting the move of offices of oil sands related companies to the region.

[1167] ACFN raised concerns that its members did not have enough work opportunities in the oil sands industry and that the opportunities that were available to them, were low paying. ACFN stated that this problem was caused by lack of education of community members. Furthermore, working in the industry keeps the workers away from their families and that also has a negative impact. Working in the oil sands industry also creates "haves" and "have-nots" in the ACFN community, such that those people who can go off reserve to work are better off than those who cannot. ACFN also identified other concerns in the work force such as discrimination and lack of opportunities for advancement for First Nations people. ACFN noted that impact benefit agreements with companies have supported training initiatives that have helped to address some concerns.

[1168] ACFN also had concerns about quality of life. In some cases, improved road access to areas increases competition for resources by nonaboriginal hunters and trappers. Access restrictions and other concerns result in its members being deterred from going out to hunt and fish and therefore having lower catch rates. These factors resulted in higher cost for traditional activities and more dependence on store-bought foods. Store-bought food is more expensive and more difficult to find because there are few stores. ACFN believed that its members suffer from poor health as a result of moving away from traditional food and toward processed food. It stated that this poor health was exacerbated by the lack of home-care and other health-support programs. In addition, ACFN believed a lack of respect for ACFN members and its values has resulted in poor mental health of some of its members.

[1169] ACFN also said that its members were involved in fewer outdoor activities because they are afraid that the water involved in many of those activities is not safe. For most outdoor pursuits, ACFN members feel it is necessary to carry drinking water with them, limiting the distances they can travel.

Analysis and Findings

[1170] The Panel recognizes that the high cost of living, insufficient health and education facilities, and a lack of retail services deter new community development and make an area less desirable to live in. The Panel notes that the very high cost of housing in RMWB is significantly increasing the average cost of living in the region. The Panel further recognizes that Aboriginal residents of the region are particularly impacted by the lack of availability and cost of housing and the need to be increasingly reliant on more expensive store-bought foods.

[1171] The Panel recognizes the importance of the region's Aboriginal population being able to access contract and employment opportunities. The Panel believes that efforts must continue to increase participation opportunities and to assist eligible and interested Aboriginal people in securing more responsible and better paying jobs.

[1172] The Panel is aware of the health care challenges in the region related to insufficient clinical infrastructure and difficulties in recruiting and retaining qualified staff. High quality and readily available services are essential in creating attractive well-functioning communities. While recognizing the staffing and infrastructure challenges faced by health care service providers in the region, the Panel is encouraged by the recent commitments of the Government of Alberta to address these key issues.

[1173] To address health-related community concerns in Fort McKay, the Government of Alberta recently signed a letter of intent to develop a comprehensive community health assessment for Fort McKay. Although no agreement has yet been reached, the Panel understands that discussions between the provincial government and First Nations have also been held to consider a similar study in Fort Chipewyan. The panel is strongly supportive of this approach and encourages the Government of Alberta to place a priority on timely completion of these assessments.

CAPACITY OF RENEWABLE RESOURCES

Evidence

[1174] ACFN explained that its members require access to land of sufficient resource quality and quantity. It stated that the renewable resources found on the land have to be sufficient to meet current and future subsistence requirements and cultural needs. It stated that these resources include routes of access and transportation, water quality and quantity, healthy populations of game in preferred areas, cultural and spiritual relationships with the land, abundant berry crops in preferred areas, traditional medicines in preferred areas, and natural landscape for the experience of remoteness and solitude. ACFN stated that the lands and resources must be accessible within constraints of time and cost. Other Aboriginal groups expressed similar beliefs.

[1175] The evidence presented below is a summary of evidence provided in earlier sections of this report and is provided to give context to the reader.

Moose

[1176] Shell stated that there would be no significant effects on moose abundance, habitat, and movement after closure and reclamation in the LSA. Shell found a high environmental consequence to moose habitat in the LSA from the Project but a low consequence to moose abundance in the LSA. Shell also stated that there would be no significant cumulative effects on moose. Shell indicated that the environmental consequences to moose habitat would be moderate from the PIC to the application case and high for the PDC. For moose abundance, it would be moderate for both the PIC to the application case and the PDC. Shell indicated no significant effects because the resilience of the moose population in the RSA had not been compromised.

[1177] ACFN and other Aboriginal groups stated that moose are considered to be a culturally important species that is still harvested today, providing an important source of protein for the community. They expressed concern about the health of moose and the quality of the resource. ACFN noted that many of its members will avoid the use of moose if there is a perceived behavioural or physical abnormality. ACFN also stated that its use of moose will be affected by reduced access to moose habitat and increased industry and recreational access. ACFN indicated that the Project would affect high-quality moose habitat and that there would be significant cumulative effects on moose habitat in the RSA.

[1178] OSEC provided evidence from provincial surveys indicating that moose populations are already declining in the RSA.

Caribou

[1179] Shell indicated that caribou are virtually absent in the LSA. Shell provided a CEA on caribou in which it stated that caribou are declining to extirpation in the RSA and concluded that both the application case and the PDC will have significant adverse effects on caribou in the RSA.

[1180] ACFN stated that caribou is a preferred, unique, and culturally important traditional resource that is important for knowledge, use, and practice. ACFN indicated it also has a spiritual connection and relationship with the caribou.

[1181] ACFN, MNA, NSFMFM, and MCFN disagreed with Shell's assertion that caribou were virtually absent in the LSA and provided anecdotal evidence of caribou use in the LSA. Several Aboriginal groups expressed concern that caribou are declining. ACFN provided evidence indicating that the Project will remove or affect high-quality habitat and that caribou will be adversely affected by direct disturbance. It indicated particular concerns about project effects on culturally important populations of woodland caribou in the RSA and beside the Project LSA (Kearl Lake area) and about cumulative effects on core habitat near the Project. ACFN also stated that use of caribou will be affected by reduced access, increased industry and recreational access, and perceived increases in contamination of traditional resources leading to avoidance or reduced use.

[1182] EC indicated concern about project effects on nearby critical habitat in the Richardson Range, indicating that displacement of wolves and their prey may increase predation risks for caribou. OSEC and EC both expressed concern about cumulative effects on high-quality caribou habitat in the RSA.

Bison

[1183] Shell indicated that wood bison, a species at risk, were found in the LSA in the past and that high-quality wood bison habitat would be adversely affected by the Project but that wood bison do not currently use the area east of the Athabasca River and therefore will not be affected by the Project. Shell assessed the cumulative effects on wood bison and found no significant adverse effects as a result of the application case or the PDC.

[1184] ACFN and MCFN both indicated that wood bison is a traditionally important resource. ACFN noted that declines in this species have already affected their use of this resource. ACFN further stated that it has documented historic and current hunting of wood bison within the ACFN's RSA, which it defined as being 5 km or less from Shell's Project footprint and that it has observed the area of the proposed Redclay Compensation Lake and the Firebag River to be core bison habitat.

[1185] ACFN contended that creation of the Redclay Compensation Lake would adversely affect bison in the Ronald Lake herd. ACFN expressed its concern about effects on this herd since it is the only bison herd that can be hunted in ACFN's traditional territory, therefore effects on the herd will affect traditional use of the species.

[1186] EC stated that there is currently no recovery strategy for bison; therefore it has identified no population objectives or critical habitat for the species.

Traditional Plants

[1187] Shell stated that in the LSA the Project will alter 4584 ha (77 per cent of resource) of the high traditional-use plant potential, 8481 ha (92 per cent of resource) of the moderate traditional plant potential, and 10 129 ha (70 per cent of resource) of low traditional use plant potential, during construction and operations. Shell stated that in the RSA, the application case will alter 5749 ha of high, 9623 ha of moderate, and 10 591 ha of low traditional plant potential. Shell indicated that it designed its planting prescriptions for reclamation to provide a range of ecosite phases that should support a variety of traditional end-land uses. It indicated that the planting prescriptions included species that are highly used by First Nations.

[1188] ACFN stated that the number of plants in Shell's reclamation sites will be less than that which currently exists, and Shell did not provide information about how it intends to re-establish the predisturbance diversity of plant species or how diversity will be enhanced in areas where direct soil placement is not possible.

[1189] Most Aboriginal groups stated that the areas south of McClelland Lake and around Kearl Lake are particularly unique because they supply plants that are valued as food and for medicinal uses.

[1190] ACFN produced evidence of subsistence-use value related to plant gathering in the Project area and in the RSA. ACFN stated that these subsistence values will be directly or cumulatively affected by the Project.

[1191] The NSFMFM stated that its members gather a variety of plants in the Project area, including blueberries and low-bush cranberries.

[1192] FMMFN #468 had concerns about certain plant species that would be potentially affected by the Project, including a wide selection of berries and traditional medicines such as roots, bark, and sweetgrass.

[1193] Most Aboriginal groups expressed concerns that the quality and quantity of traditional plants are declining in the oil sands region. The Aboriginal groups stated that they are concerned about the contamination of traditional plants and that these concerns foster avoidance of use.

Natural Environment/Landscape

[1194] All the Aboriginal groups raised the concern that the amount of pristine and undisturbed landscape available for the practice of TLU and Aboriginal and treaty rights is decreasing because of a wide array of factors, including noise, impediments to access, poorer air quality, and perceived contamination of resources.

[1195] Fort McKay stated that because of extensive development, the ecological sustainability of several watersheds is threatened and the environment may have already reached a point where it is not possible for Fort McKay to sustain its traditional lifestyle.

[1196] ACFN and the NSFMFM discussed the importance of muskeg ecosystems. ACFN also discussed the importance to its members of being in the natural environment and feeling connected to the land. It stated that there is a loss of connection to the land resulting from a sense of alienation from preferred harvesting areas and because of the changes in the land cause by industrial practices. It also commented that removal of areas affects the knowledge of place names, histories, and cultural practices.

[1197] According to ACFN and MCFN, their members are avoiding using an increasingly larger portion of traditional lands because of oil sands related development. Other Aboriginal groups expressed similar concerns.

[1198] Shell provided information indicating that it would not reclaim certain types of landscapes, such as peatlands, because no method of reclamation is available. Shell also indicated that the reclamation landscape would contain more uplands and fewer lowlands than what currently exists. Shell also proposed to divert the Muskeg River.

Analysis and Findings

[1199] The Panel notes that several Aboriginal groups are of the opinion that the oil sands region is reaching a point where renewable resources will not have the capacity to sustain their Aboriginal or treaty rights. The Panel understands that important resources for Aboriginal use will be affected in the oil sands region. Wildlife will move out of developed areas and may no longer be easily accessible or reasonably close to certain groups or individuals. The duration of these effects will be prolonged, lasting decades, because most reclamation occurs after the operation of the projects and some habitat types (peatlands) cannot or will not be reclaimed. The Project will adversely affect some traditional resources in the LSA, and given that the Project is nearly surrounded by other oil sands projects, the total area lost for TLU is several times larger than the Project footprint alone. The Panel's TOR require that the Panel assess the capacity of renewable resources that are likely to be significantly affected by the Project in order to meet current and future needs.

[1200] The Panel notes the importance of caribou, moose, and bison to Aboriginal people, for consumption and from a cultural perspective.

[1201] The Panel notes that caribou and wood bison are species at risk in the oil sands region, and populations are already considered not to be self-sustaining. The Panel finds that populations of woodland caribou will require considerable protection and wood bison will require informed management, in order to be restored to levels that can be self-sustaining and available as a resource for Aboriginal people.

[1202] The Panel further notes that evidence provided by both Shell and other interested parties indicated there would be project and cumulative effects on caribou.

[1203] The Panel notes evidence from Shell that bison declines are predominantly a result of disease. The Panel also notes ACFN's identification of core bison habitat close to the Project's footprint and within the area of the proposed Redclay Compensation Lake.

[1204] The Panel observes that moose, although not a species at risk, may be declining in the area. The Panel finds that regardless of whether the moose population is declining, Aboriginal people are not using this resource as they did in the past because of access issues, perceived contamination, and concerns about the health and quality of moose as a subsistence resource.

[1205] The Panel notes that because caribou, moose, and bison are large, wide-ranging mammals with extensive home ranges, the RSA is the more appropriate spatial boundary for assessing capacity of these resources. The Panel further notes that the most appropriate temporal boundary is one Aboriginal generation, given that the effective loss of use of caribou, bison, and moose for more than one generation could result in loss of traditional knowledge of these resources. Also, the Panel finds that the current reduction in use of caribou, moose, and bison is already having adverse effects on Aboriginal lifestyle and culture.

[1206] The Panel finds that the evidence presented for woodland caribou, wood bison, and moose suggests that the needs of the Aboriginal people are currently adversely affected. The

Panel also finds that the evidence indicates that woodland caribou, wood bison, and moose habitat will be cumulatively affected in the future in the RSA. The Panel notes that reclamation may eventually restore some habitat for these species in the RSA but that the current and future use for Aboriginal people is likely to be affected. The Panel further notes that most reclamation will not happen during the lifetime of the current Aboriginal users and that the effects will last for more than a generation. Additionally, the Panel notes that peatlands may never be able to be reclaimed and reliance on this habitat by any of these species will therefore be permanently affected.

[1207] The Panel has determined that significant adverse cumulative effects to caribou have occurred and will continue in the application case and the PDC and this has and will have a significant effect on the ability of Aboriginal people to make use of this resource to meet their current and future needs.

[1208] The Panel has determined that cumulative effects on moose and wood bison are adverse but not likely to be significant. The Panel's determination for these species is based in part on the absence of reliable population data for moose and the lack of information on the location of important wood bison habitat which made it difficult to assess the significance of effects. However, the Panel believes that project and cumulative effects on these species are adverse and this has had and will have an impact on the ability of Aboriginal people and other users to use these species to meet their current and future needs.

[1209] The Panel recognizes that the oil sands region provides habitat for many traditional plants that are still important to Aboriginal people.

[1210] The Panel recognizes that clearing of the LSA will result in a loss of traditional plant habitat for at least one Aboriginal generation and that reclamation may or may not result in the re-establishment of traditional plants. The Panel notes that the Project will affect a considerable area of high and moderate traditional plant potential areas. The Panel further notes that the Project is in an area already affected by oil sands development; therefore, locating traditional plants in areas accessible by and close to some Aboriginal groups will be difficult.

[1211] The Panel finds that the capacity of traditional plants will be significantly affected by the Project. The Panel acknowledges that this will in turn affect the TLU of the Aboriginal people and affect the transmission of Aboriginal culture.

[1212] The Panel recognizes that the ability to use and enjoy the land is of utmost importance to Aboriginal people and their culture. The Panel understands that Aboriginal people have a spiritual connection to the land.

[1213] The Panel notes that during construction and operations, the Project area will not be available for use by Aboriginal groups in the traditional way. The Panel further notes that, after reclamation, the landscape and ecosites will be changed as there will be more uplands and fewer lowlands, including that peatlands will be removed and the course of the Muskeg River will be altered. The Panel acknowledges that the existing cultural, spiritual, and aesthetic values that the Aboriginal people have in this area may be altered due to the changes. The Panel recognizes that the effects of previous and current industrial development in the RSA are already limiting the amount of pristine land available for nonconsumptive use.

[1214] The Panel finds that the capacity of the natural landscape for use by Aboriginal people for solitude, cultural practice, and spirituality will be significantly affected in the LSA for a time greater than one generation and may be permanently affected because of changes in land shape, form, and ecosite types. The Panel finds that the natural landscape in the RSA is already significantly affected by current and approved projects, and that this is affecting current and future needs. The Panel acknowledges that this will in turn affect the use and knowledge of this area by Aboriginal people.

EFFECTS ON ABORIGINAL TRADITIONAL LAND USE, RIGHTS, AND CULTURE

[1215] To assess the effects of the Project on Aboriginal TLU, rights, and culture, it is necessary to consider the effects of the Project on the biophysical resources important to Aboriginal people and other economic and sociocultural effects of the Project. The discussion in this section therefore draws on evidence and Panel findings presented in other sections of the report. Although this results in repetition of material, the Panel believes that this repetition is warranted to provide a fulsome discussion of the issues and to produce a standalone section that does not require the reader to refer to other sections.

Shell's Assessment of Effects on Aboriginal Traditional Land Use, Rights, and Culture

Evidence

Shell's Approach to Assessment of Effects on Traditional Land Use

[1216] Shell stated that the Project will be located within the traditional lands of FMFN, ACFN, and MCFN. Shell stated that the Project was also on the northern fringe of the traditional territory identified by the FMMFN #468 and that the Métis living in the Fort McMurray region also make use of the lands for traditional activities.

[1217] Shell submitted that it had assessed the impacts of the Project on TLU as required by the terms of reference for the EIA. Shell stated that it used the effects of the Project on resources used for traditional activities, and on the access to such resources, as a proxy for the assessment of the effects of the Project on TLU. Shell submitted that if the Project was not likely to have a significant adverse effect on the resources in the region or significantly impede access to the resources in the region, it would not expect the Project to result in significant adverse effects to the traditional land users' ability to practice traditional pursuits.

[1218] Shell stated that it defined a local study area for traditional land use (TLU-LSA) based on the registered fur management areas (RFMAs or traplines) that intersect with the Project in order to determine the traditional use in the area and to collect traditional knowledge. Shell submitted that traplines are an appropriate basis for defining LSAs for TLU since they provide an important location from which traditional activities are conducted. Shell referenced an FMFN study that confirmed the strong relationship between traplines and traditional lifestyles. The study said "The term trapline as used in this study means more than just a place to harvest furs for sale on the commercial market. It means the territory where people hunted, fished, picked berries, gathered duck eggs, and trapped fur for local domestic consumption and trade. The trapline was the community food supply for the people interviewed in this TLUOS [traditional land use and occupancy study]; it was and is synonymous with meat for the table, with stewardship of all natural resources; with extended family sharing; with socialization of children; with the role of the elders as carriers and teachers of traditional environmental knowledge; and with cultural sustainability."

[1219] In its EIA, Shell defined the TLU-LSA as the six traplines that overlap the Project and PRM development areas, including RFMAs 2939, 1275, 2331, 1716, 1714, and 2137. RFMAs 2331, 1716, 1714, and 2137 are located on the east side of the Athabasca River and are most closely associated with the Project. According to Shell, these traplines were registered to an ACFN member (1714), a Métis person (1716), an FMFN member (2137) and a nonaboriginal person (2331).

[1220] Shell stated that the objectives of the TLU study for the TLU-LSA were to:

- document historical and current land use, and the traditional knowledge of the Project development areas and surrounding areas by local trappers;
- document the TLU and traditional knowledge of the FMFN, ACFN, MCFN, and FMMFN in relation to the Project development areas; and
- provide information to help minimize the impacts of the Project on TLUs.

[1221] Shell interviewed the holders of the directly affected traplines to assess the effects of the Project on traditional resources and on traditional use. Shell provided a description of the hunting, trapping, and gathering activities of the trapline holders and evidence of other types of use on the traplines, including the presence of cabins and sweat lodges. Shell also provided information on use of the trapline areas by other residents or users in the Cultural Environmental Setting Report (Cultural ESR) submitted as part of the EIA. Shell stated that it conducted no other individual interviews to assess the effects of the Project on access to traditional resources at the TLU-LSA level.

[1222] Shell stated that it also relied on a variety of written and historical information sources, previous project-specific impact assessment reports, and project-specific consultation with FMFN, MCFN, and ACFN to complete its TLU assessment.

[1223] Shell stated that it defined three regional study areas for the TLU assessment (TLU-RSA) based on the traditional territories of FMFN, ACFN, and MCFN and the Culturally Significant Ecosystems (CSEs) of the FMFN. Shell stated that while available information suggested that FMMFN #468 may have harvested in the area around McClelland Lake, the large majority of its traditional activities have occurred south of Fort McMurray and the Clearwater River, and therefore, the Project was unlikely to have a significant effect on its TLU practices.

[1224] Shell acknowledged that members of the MNA, have ties to the land similar to those of the First Nations, pursue a traditional way of life within this area, and are long-standing residents of the communities of Fort Chipewyan, Fort McKay, Fort McMurray, and other smaller communities in northeastern Alberta. Shell noted that although it did not identify a specific TLU-RSA to represent the focus of Métis traditional uses, it recognized that Métis people were participants in regional TLU patterns through active operation of RFMAs, as well as hunting, fishing, and gathering throughout the RSAs.

[1225] Shell stated that the zones of traditional use defined in the TLU-RSAs represent the joint use of a region and its resources by the members of nearby Aboriginal communities that practice relatively similar traditional pursuits and that much of the information detailed in the assessment was sufficiently general to have application to other Aboriginal peoples.

[1226] Shell stated that it assessed the effects of the Project in combination with existing, approved, and planned regional developments in relation to the RFMAs and the TLU-RSAs and considered them in relation to these traditional areas and the traditional ways of life that were recorded in the TLU studies and project-specific impact assessments used by Shell.

[1227] Shell stated that it had integrated traditional wildlife knowledge and resource use data into its ESR sections on mammals, birds, and important wildlife habitat and that it also used TEK and TLU information in some sections of its EIA, including traditional knowledge related to the consumptive and medicinal use of plants and human health. Shell acknowledged that a CEMA-sponsored workshop held in 2005 provided some of the TEK used in the EIA.

[1228] Shell stated that it received additional information from the Aboriginal groups since the EIA was submitted in 2007 but this additional information either added nothing new or did not change the initial conclusions of the EIA. Shell stated that it incorporated some of this additional information, such as the use of water routes, in the subsequent cultural effects assessment that it completed.

[1229] Shell stated that it had and was continuing to consult with the Aboriginal groups whose traditional territories overlapped the proposed Project area to further enhance its understanding of traditional use activities in the area.

[1230] The Aboriginal groups raised several concerns regarding the methodology Shell used to assess effects to Aboriginal TLU and Aboriginal and treaty rights.

[1231] ACFN disagreed with Shell that an assessment of the significance of effects on resources important to traditional users and on access to such resources could be used as a proxy for assessing the significance of the effects on TLU. ACFN also questioned Shell's use of the RFMAs as the basis for defining the TLU-LSA and Shell's reliance on TEK and TLU provided by the RFMA holders. ACFN also said that the impacts on First Nations' traditional resources were not rigorously measured in any part of Shell's assessment. ACFN stated that in the absence of specific data, measures, thresholds, and criteria to assess impacts on Aboriginal rights, it is difficult to understand Shell's assertion that it has assessed such impacts.

[1232] ACFN also submitted that Shell placed an inappropriate reliance on far future and uncertain reclamation activities to mitigate Project effects on the environment and TLU. With respect to traditional knowledge and land use, ACFN considered the loss of an area for more than one generation to be permanent.

[1233] FMMFN #468 argued that Shell should have used a larger LSA and that the significance of Project effects should also have been considered at the LSA level. FMMFN#468 also argued that the RSA was too large because Shell originally established it to encompass two projects and it was therefore inappropriate for one project. FMMFN #468 also said Shell had failed to appropriately consider ecological context when assessing effects to both terrestrial resources and

Aboriginal and treaty rights. FMMFN #468 said that ecological context needs to consider the size of the footprint and the amount of other disturbance in the area.

[1234] ACFN, MNA, FMMFN #468, and the NSFMFM and Clearwater Band were concerned about the extent to which Shell incorporated TLU or TEK information provided by the Aboriginal groups into the EIA.

[1235] The specific concerns and issues identified by the Aboriginal groups are discussed more fully in the following sections for each Aboriginal group.

Shell's Assessment of Effects on Traditional Land Use

[1236] Shell's EIA included a qualitative analysis of the effects on TLU within the TLU-LSA and TLU-RSAs based on historic information provided by regional traditional land users and specific information from holders of RFMAs in the TLU-LSA. In addition, it completed a quantitative analysis to determine the total area of land that would be permanently or temporarily unavailable for TLU, and the amount of land that would be available for TLU after reclamation of the Project.

[1237] Shell stated that the Project would result in a direct loss of land available for trapping, hunting, and plant harvesting in each of the RFMAs. Two trapper cabins within the Project area would need to be relocated and two berry harvesting areas within the Project area would also be affected. Shell estimated that the total percentage of disturbance for the RFMAs in the application case would range from 4 to 73 per cent with the Project accounting for less than 1 per cent to 27 per cent of the disturbance. A portion of Table 8.1-1 from Volume 5 of Shell's EIA is reproduced below.

RFMA	Area of RFMA	Base case total disturbance area [ha (per cent)]	Application case total disturbance area [ha (per cent)]	Change due to Project [ha (per cent)]
1714	30 096	18 010 (46)	28 373 (73)	10,364 (27)
1716	23 657	6 872 (29)	10 217 (43)	3 345 (14)
2137	27 097	10 599 (39)	11 289 (44)	690 (3)
2331	31 389	1 106 (4)	1 132 (4)	26 (<1)

[1238] On a regional scale, Shell estimated that the combined Project and PRM would increase the area of disturbances within the MCFN and ACFN RSAs by less than 1 per cent each. Within the all-traditional-uses CSE for FMFN, the Project would increase the area of disturbance by 2 per cent for moderate use areas, and by less than 1 per cent for the low use and intense use areas.

[1239] Shell stated that to mitigate the potential impacts of the Project on TLU, it would:

- provide compensation to directly affected RFMA holders;
- continue consulting with key Aboriginal groups including FMFN, ACFN, and MCFN;
- facilitate access across the Project area by trappers to their traplines;
- provide cultural diversity awareness training to Shell employees and contractors; and

- conduct ongoing consultation with key Aboriginal groups and participate in regional planning initiatives to ensure closure and reclamation plans consider the long-term sustainability of TLU activities.

[1240] Shell also stated that it would replace through reclamation, habitats that can support traditional plant harvesting and hunting or trapping of species such as moose, fisher, lynx, beaver, and muskrat in the far future.

[1241] Shell provided its assessment of the significance of project effects on TLU in November 2011. Shell stated that in determining the significance of the Project's effects on TLU, it gave consideration to what constitutes a significant effect to the resources used by traditional resource users from a scientific perspective and in an ecological context. Shell stated that while it did not consider the value placed on the resources beyond a scientific or ecological context in its determination of significance, the agencies responsible for making public interest decisions on development applications should be aware of the value placed on these resources by local users as part of their decision-making process.

[1242] Shell concluded that since it did not consider effects on fish and fish habitat a likely significant adverse effect, the Project's net effects on fishing as a TLU in the TLU-RSA was also not a likely significant adverse effect.

[1243] Shell concluded that the Project's effects on hunting and trapping as a TLU in the terrestrial RSA were also not likely significant adverse effects because it did not consider the Project's effects on wildlife and wildlife habitat a likely significant adverse effect.

[1244] Shell's assessment concluded that the Project would have negligible effects on traditional plant potential at the RSA level and, therefore, the Project would not have a likely significant adverse effect on traditional plant potential. Shell, therefore, concluded that the Project's effects on traditional plant gathering were not likely significant adverse effects.

[1245] Shell concluded that the Project would not have a significant adverse effect on navigation, including navigation by Aboriginal people because its assessment concluded that the Project would have negligible effects on water levels and flow in the Athabasca River and lower reaches of the Muskeg River and the effects of the diversion of the upper reaches of the Muskeg River would be mitigated.

[1246] Shell stated that it assessed the loss of specific traditional resources and changes to access routes. Shell did not expect the Project to result in significant effects to the traditional land users' ability to practice TLU activities in the region because it did not expect the Project to have a significant adverse effect on the resources in the terrestrial or aquatics RSAs and the Project would not prevent traditional land users from accessing any areas in the TLU-RSAs, except within the Project development area itself before reclamation. Shell also stated that it has an access management plan in place that provides either alternative or controlled access across existing operating mine sites for traditional users and trappers before reclamation.

[1247] Shell's May 2012 updated CEA provided an assessment of the amount of land that was or would be unavailable for use by RFMA holders due to developments in the base case, application case, and PDC. In its updated assessment, Shell assessed the effect of the Project on RFMA 2172 instead of RFMA 2331 that was originally included in the EIA. RFMA 2172 is located south of RFMA 1714 whereas RFMA 2331 is located on the north shore of Lake McClelland. According to Shell's updated assessment, the amount of disturbance in the application case would range from 53 to 67 per cent of the RFMAs. Table 3.5-1 from the May 2012 submission is reproduced below. Shell noted that the RFMAs are already significantly disturbed in the base case and it expected no change to the amount of disturbance between the application case and PDC.

RFMA	Area of RFMA [ha]	2012 base case total disturbance area		2012 application case total disturbance area		2012 planned development case total disturbance area	
		[ha]	Percentage of RFMA	[ha]	Percentage of RFMA	[ha]	Percentage of RFMA
#1714	38 573	17 257	45	25 636	67	25 636	67
#1716	23 657	10 324	44	13 527	57	13 527	57
#2137	27 097	12 822	47	14 369	53	14 369	53
#2172	37 071	16 179	44	23 318	63	23 318	63

[1248] Shell's May 2012 updated CEA provided an assessment of the amount of land within the FMFN all-traditional-uses CSE that was or would be unavailable for TLU for the base case, application case, and PDC. Shell estimated the amount of disturbance for both the moderate and intense use areas to be 31 per cent in the application case but noted that almost all of this disturbance is already present in the base case. Table 3.5-2 from the May 2012 submission is reproduced below. Shell noted that under the 2012 PDC, disturbances to the all-traditional-uses CSE generally occur throughout the CSE, but are significantly higher in the intense and moderate use areas.

CSE	Total area of CSE [ha]	2012 base case total disturbance area		2012 JME application case total disturbance area		2012 planned development case total disturbance area	
		[ha]	percentage of CSE	[ha]	percentage of CSE	[ha]	percentage of CSE
Low use	2 142 679	311 203	15	311 203	15	356 536	17
Moderate use	861 563	248 841	29	269 169	31	315 191	37
Intense use	309 215	94 401	31	94 401	31	110 567	36
Total	**3 313 457**	**654 445**	**20**	**674 773**	**20**	**782 294**	**24**

[1249] Shell's May 2012 updated CEA provided an assessment of the amount of land within the FMFN large-game-harvesting CSE that was or will be unavailable for TLU for the base case, application case, and PDC. Table 3.5-3 from the May 2012 submission is reproduced below. Shell noted that the amount of disturbance is highest in the intense-use-area CSE, with estimates ranging from 32 per cent in the application case to 39 per cent in the PDC.

CSE	Total area of CSE [ha]	2012 base case total disturbance area		2012 JME application case total disturbance area		2012 planned development case total disturbance area	
		[ha]	percentage of CSE	[ha]	percentage of CSE	[ha]	percentage of CSE
Low use	1 347 998	46 019	3	46 019	3	53 300	4
Moderate use	1 723 226	325 961	19	325 961	19	358 067	21
Intense use	1 018 146	302 988	30	323 316	32	393 962	39
Total	**4 089 370**	**674 968**	**17**	**695 296**	**17**	**805 329**	**20**

[1250] Shell's May 2012 updated CEA provides an assessment of the amount of land within the FMFN traditional-plant-harvesting CSE that was or will be unavailable for TLU for the base case, application case, and PDC. Table 3.5-4 from the May 2012 submission is reproduced below. Shell noted that the amount of disturbance within the traditional plant harvesting CSE is highest in the intense and moderate use areas, ranging from 34 to 55 per cent depending upon the area and case.

CSE	Total area of CSE [ha]	2012 base case total disturbance area		2012 JME application case total disturbance area		2012 planned development case total disturbance area	
		[ha]	percentage of CSE	[ha]	percentage of CSE	[ha]	percentage of CSE
Low use	1 396 491	322 516	23	330 620	24	391 989	28
Moderate use	396 759	123 063	31	135 286	34	168 537	42
Intense use	74 917	35 268	47	35 268	47	41 498	55
Total	**1 868 167**	**480 846**	**26**	**501 174**	**27**	**602 024**	**32**

[1251] Shell's May 2012 updated cumulative effects case provides an assessment with respect to the amount of disturbances within the terrestrial RSA portion of the ACFN, FMFN, and MCFN traditional territories for all cases. Table 3.5.5 from the May 2012 submission is reproduced below. Shell noted that the total amount of disturbance amounted to 6, 11, and 19 per cent of the traditional territories of MCFN, ACFN, and FMFN, respectively and that almost all of this disturbance is already present in the base case.

Traditional Territory	Total area of traditional territory	Area of traditional territory within terrestrial RS	2012 base case total disturbance area within terrestrial RSA portion of traditional territory (TT)		2012 JME application case total disturbance area within terrestrial RSA portion of traditional territory (TT)		2012 planned development case total disturbance area within terrestrial RSA portion of traditional territory (TT)	
Units	**[ha]**	**[ha]**	**[ha]**	**percentage of TT**	**[ha]**	**percentage of TT**	**[ha]**	**percentage of TT**
Athabasca Chipewyan First Nation	4 383 440	1 401 026	474 280	11	494 608	11	568 418	13
Fort McKay First Nation	3 525 101	2 130 001	650 454	18	670 782	19	779 778	22
Mikisew Cree First Nation	8 641 549	1 673 308	523 501	6	543 829	6	646 250	7

[1252] Shell said that its assessment of cumulative effects was difficult to do on a project-by-project basis and should be done at the regional scale. Shell said that some of the concerns raised by the Aboriginal groups are cumulative effects of regional development unrelated to the Project and that a project-specific assessment is not the appropriate place to address these broad regional issues. Shell stated that it would support a regional CEA with the involvement of the area's traditional land users, and supported the inclusion or consideration of such a study in the ongoing refinement and development of LARP. Shell stated that LARP and CEMA are the appropriate forums to address and manage cumulative effects across the oil sands region through setting regional objectives and quantifiable targets, and setting aside new conservation areas. Shell was of the opinion that a regional assessment should address the cumulative effects over a large region in order to inform the objectives of the regional development in terms of economic development, social responsibility, and environmental protection. Shell was of the opinion that Aboriginal traditional knowledge should be considered as a part of this regional assessment.

Shell's Approach to the Assessment of Effects on Aboriginal Culture

[1253] Shell stated that the focus of its assessment of the potential effects of the Project on elements of Aboriginal culture was on project effects on the culture of potentially impacted Aboriginal groups whose traditional use overlapped the Project footprint, including the ACFN, FMFN, MCFN, FMMFN #468, and Métis Locals 63, 125, and 1935. Shell stated that it based its cultural assessment on a review of its consultation records, TLU information, literature pertaining to and written by Aboriginal people in the region, reports and academic literature, the discipline-specific impact assessments from its EIA, and other documents. Shell stated that its cultural assessment relied in part on studies commissioned by the Aboriginal communities themselves, including documents prepared by the FMFN, ACFN, and MCFN specifically for the Project. Shell stated that although available information suggested that FMMFN #468 engaged in less traditional activity in the general area in which the Project is situated, the cultural assessment assumed that the Project's potential effects to their cultural elements would be similar to the assessed effects on cultural elements of other Aboriginal groups.

[1254] Shell stated that the significance of impacts on the exercise of Aboriginal rights and interests could not be determined in the same manner as the biological or environmental KIRs and that a determination of significance of impacts to Aboriginal rights and interests involves consideration of more than simply the ecological effects on a particular KIR being impacted within the TLU-LSA and TLU-RSA. Shell stated that the determination of significance would require consideration of the extent to which a KIR was preferentially used or accessed by an Aboriginal group and whether there were other sociocultural or economic factors that contribute to the ability or desire of an Aboriginal group to exercise particular rights based on that KIR.

[1255] Shell stated that to assess project effects on Aboriginal culture, it established linkages between the Project's activities and potential changes or effects on tangible and intangible elements of Aboriginal culture. Shell defined tangible elements of culture as including those things that can be seen or touched and were the physical resources upon which cultural practices, values, or beliefs rely, such as culturally important plant and animal species, hunting areas, landscapes, and spiritual sites. Shell defined intangible elements of culture as those things that cannot be seen or touched but are nonetheless important to culture such as language, values, traditional knowledge, oral history, social relationships, spiritual or religious beliefs, and customs. Shell determined the linkages by using TLU reports from the Aboriginal groups. Shell stated that it relied on its EIA to identify the impact of the Project on various receptors that are culturally important to Aboriginal people and on the interviews with the trapline holders in order to gather information on impediments to access.

[1256] Shell stated that if a tangible element of culture, such as a wildlife species or traditional plant was not affected by the Project or remained accessible in the region, it expected no effects on TLU and no effects on the intangible elements of culture such as the passing on of traditional knowledge.

[1257] ACFN was critical of Shell's approach to the assessment of social, economic, and cultural effects on ACFN. ACFN stated that Shell's socioeconomic assessment focused narrowly on mainstream economic issues and did not appropriately consider the unique interests, values, and culture of ACFN. Similarly, ACFN was of the view that Shell's cultural assessment suffered from several methodological shortcomings and did not provide a proper assessment of the impacts of the Project or oil sands development more generally on ACFN culture.

Shell's Assessment of Effects on Aboriginal Culture

[1258] Shell noted that Aboriginal persons in the oil sands area have experienced a series of changes in their lifestyle over the last 50 years, some positive and some negative. Shell stated that the oil sands industry was an important factor of change in Aboriginal lifestyle in the Athabasca region. The taking up of land for industrial purposes, the use of regional water sources, increased opportunities for engagement in the wage economy, and an increased nonaboriginal population in the region were some of the factors that have collectively contributed to social and economic changes within the Aboriginal communities, including changes to the extent to which individuals participate in TLU and cultural activities or adopt nonaboriginal cultural values or practices.

[1259] Shell provided a summary of the mitigation measures it has taken or plans to take to mitigate the effects of the Project on Aboriginal culture. These measures include but are not limited to:

- consulting with key Aboriginal stakeholders to ensure that it understood impacts to TLU and cultural activities and that it identified appropriate mitigation;
- providing support for Aboriginal training, employment, and business development;
- ensuring access across Project lands is facilitated;
- providing support for programs to collect and retain TLU information and TEK; and
- supporting various community-based cultural events and initiatives.

[1260] Shell determined that the effects of the Project on tangible and intangible elements of culture would range from negligible to moderate. It considered many of the effects minor, such as project-related effects to the availability of lands for traditional activities, availability of wildlife habitats, ability to pass on traditional knowledge, and project-related effects on language retention, income disparity, and increases in nonaboriginal population. It assessed the greater effects to be related to visual aesthetics, which will have an effect on wilderness character and a sense of solitude. Table 8 from the May 2012 cultural assessment provides a summary of the expected impacts to culture and is reproduced below.

Table 8 Elements of Culture and Project Effects Summary

Element of culture	Project Effect on Element of Culture
Availability of land for traditional activities	The project is expected to have a small effect on the availability of land for traditional activities. Aboriginal people will continue to have opportunities to hunt, trap, and fish and pursue other traditional activities and pass on skills and TK to successive generations.

Element of culture	Project Effect on Element of Culture
Ability to access land and water resources for traditional activities	Project-related activities are expected to have a negligible environmental consequence on land access in the LSA and RSA. Aboriginal people will retain access to land to carry out traditional activities.
Availability of traditional resources to sustain harvests and other cultural activities	The environmental consequences of the Project on the availability of large game and furbearers at the regional and local scales were assessed to be negligible. Hunting opportunities are not expected to be affected by the Project. The environmental consequences of Project activities on traditional plants are expected to result in a negative moderate environmental consequence to high traditional plant potential areas in the LSA during construction and operations. At the RSA, the JME results in a negligible environmental consequence to high traditional plant use areas during construction and operations. The Project's effects on fish abundance were assessed to be negligible. The effects of the Project on traditional plant harvesting were assessed as moderate in the LSA and negligible at the RSA level.
Availability to support wildlife, aquatic and plant resources	The environmental consequence of Project impacts on large game and furbearer habitat are expected to be moderate to high at the local level. The Project is expected to have some effect on intangible aspects of culture as they relate to the availability of wildlife habitats. These effects are expected to be limited to traditional activities occurring at the two directly affected RFMAs held by members of the FMFN, and an RFMA held by a member of the ACFN.
Historic resources	The Project is predicted to have a negligible direct effect on historical resources. Indirect effects are predicted to be negligible to low.
Availability of trusted sources of water for consumption	The Project is expected to result in small to negligible changes to water quality. Fish, an important part of diet, will not be affected due to any deterioration of water quality.
Air quality	There will be changes in ambient air quality that will have a negligible to low environmental consequence.
Human health risk	Project-related emissions are predicted to have minimal impacts on human health as a result of inhalation of acrolein, long-term inhalation of hydrogen sulphide, and long-term inhalation of nasal irritants. Incremental cancer risk due to exposure to carcinogens is assessed as negligible. The Project is not expected to contribute to potential adverse wildlife health effects. Aboriginal people can remain confident in country foods.
Noise and visual effects	During Project operations, the environmental consequences of project-related visual effects were assessed to be negligible to moderate. To manage noise, Shell will develop an operational noise management plan and implement it during detailed design to address the potential for moderate magnitude impacts. Potentially affected parties will be consulted during Project construction and operations regarding noise levels. Noise impacts from the Project were assessed as negligible at Fort McKay; intermittent noise cannons may be heard by FMFN and ACFN trappers in the vicinity of the Project. Impacts on visual aesthetics will be mitigated as the project development area will be reclaimed and facilities will be decommissioned and removed. The magnitude of visual aesthetics impacts as a result of the Project will be reduced to negligible. Therefore, the environmental consequence of the Project on all landscape units will be negligible.

Element of culture	Project Effect on Element of Culture
Participation in wage economy	The Project's contribution to the expansion of wage economy opportunities for Aboriginal persons and companies is expected to be small in view of other already existing opportunities. Increased employment of Aboriginal people is a benefit.
Language retention	Aboriginal language retention has been dropping for some time, and is expected to continue regardless of the Project's development. The Project's contribution to the decline is considered to be small.
Effects of increase in non-Aboriginal population	The effects of increased population growth in the region as a result of Project activities is considered to be small, as competition for natural resources is not expected to increase due to Shell's workforce management. Hunting success is not expected to be affected.

[1261] In summary, Shell submitted that the Project would have a negligible or very minor effect on the elements of Aboriginal culture. Shell acknowledged that there may be some residual effects of the Project on the intangible elements of Aboriginal culture; however, Shell did not complete a CEA for these impacts.

Analysis and Findings

Effects on Traditional Land Use and Rights

[1262] The Panel notes that the Aboriginal groups raised a number of concerns about the methodology that Shell used to assess the potential impacts of the Project on TLU and Aboriginal and treaty rights. The most significant issues raised were related to Shell's use of the RFMAs as the basis for defining the LSA for TLU, the emphasis it placed on information provided by RFMA holders in assessing impacts to TLU and Aboriginal and treaty rights, the large size of the RSA and its use as the basis for determining significance of effects, and the extent to which Shell incorporated TLU or TEK information provided by the Aboriginal groups and communities into the assessment.

[1263] The Panel notes that Shell appears to have relied to a significant degree on information provided by the four trapline holders to establish the linkage between project effects and potential impacts to TLU and Aboriginal rights and interests. While the Panel believes incorporating information from the trapline holders into the assessment is appropriate and important, the Panel agrees with ACFN that the RFMA holders' rights are distinctly different from Aboriginal and treaty rights and that the trappers' use of the land may not accurately represent the range of Aboriginal TLU and cultural activities practiced by First Nations or other Aboriginal groups. The Panel believes that in order to assess project effects on Aboriginal TLU and Aboriginal and treaty rights within an LSA defined by the traplines, one would have to assess the effects for all of the Aboriginal groups that use the trapline area, not just the trapline holders, and the assessment would need to consider all types of traditional use.

[1264] The Panel acknowledges that Shell did make use of other sources of information on TLU and there is evidence of use of information other than that which Shell gathered from the trapline holders in its Cultural ESR. However, it is not clear to the Panel how or to what extent Shell incorporated this information into its assessment of Project and cumulative effects on Aboriginal TLU. As a result, the Panel is of the opinion that Shell's assessment of the effects of the Project on TLU, largely based on interviews with four trapline holders, is insufficient to characterize the Aboriginal traditional use in the Project area.

[1265] In the Section Methods Used to Assess Effects on Terrestrial Resources, the Panel noted its concerns about the large size of the RSA and its use as the basis for assessing the significance of Project and cumulative effects on terrestrial resources. The use of an RSA that is very large compared with the size of an LSA or project footprint has the effect of diluting potential effects and may do so to the point where they do not appear to be significant. The Panel has a similar concern about Shell's choice of RSAs for the assessment of effects to TLU and Aboriginal and treaty rights. The Panel does not believe that use of the entire traditional territory of a First Nation or Aboriginal group is an appropriate basis for determining the significance of effects. These traditional territories tend to be very large and not all areas of the traditional territory may be used or are readily accessible for TLU or cultural activities. The Panel does not accept that the effects on TLU or Aboriginal and treaty rights are not significant so long as resources are available anywhere within the traditional territory of a First Nation or Aboriginal group. The Panel believes that the resources must be in areas that are familiar and accessible to Aboriginal persons with a reasonable level of effort.

[1266] The Panel notes that Shell obtained most of the TEK used in the EIA from the trapline holders, a CEMA-sponsored community workshop held in 2005, and prior studies completed for other projects. Shell did not explain how the project-specific TEK from only four trapline holders was sufficient for the Project. The Panel also notes that the CEMA-sponsored workshop gathered TEK from "participants" and community residents from Fort Chipewyan and Fort McKay without clearly identifying to which First Nation or Aboriginal organization the participants belonged. The Panel is therefore of the opinion that the TEK gathered from the trapline holders and CEMA-sponsored workshop alone is not sufficient to identify the effects of the Project on the TLU activities or rights of individual First Nation or Aboriginal groups. The Panel also notes that, in its May 2012 submission, Shell replaced RFMA 2331 by RFMA 2172 as a potentially affected trapline. The Panel agrees that it is relevant to include RFMA 2172 but is unaware of any interviews that Shell conducted in order to assess the TLU or collect TEK in relation to the area where RFMA 2172 is found.

[1267] The Panel understands the challenges associated with attempting to reconcile information collected by western scientific methods with TEK provided by Aboriginal groups or individuals. The Agency's guidance document, "*Considering Aboriginal traditional knowledge in environmental assessments conducted under the Canadian Environmental Assessment Act – Interim Principles*", states that where TEK and western knowledge cannot be reconciled, the EIA practitioners should juxtapose what is suggested by each knowledge system in the EIA report and demonstrate how they have considered each in their EIA. The Panel notes that Shell did not do this and it is unclear to the Panel how Shell considered the TEK it received. Shell's assertion that all of the TLU and TEK information it received from the Aboriginal groups since filing the EIA in 2007 did not provide any new information or change the conclusions of the EIA is somewhat surprising. The Panel would be concerned if the inability to reconcile TEK with scientific data was used as justification for limiting the utilization of the TEK in the analysis.

[1268] The Panel finds that Shell's approach for the assessment of project effects on TLU does not consider whether there are other sociocultural or economic factors that contribute to the ability or desire to participate in certain TLU activities or exercise particular rights. The Panel is of the opinion that assessing the effects of noise or air quality on traditional resources is not sufficient and that the significance of the effects of noise and air quality on land use has to be assessed as well. While the Panel is satisfied that the Project will likely not contribute in a significant way to health issues related to air contaminants, the Panel believes that perceived bad air quality and unpleasant odours could foster the avoidance of traditional use. The Panel also believes that the perceived contamination of surface water and country foods are impediments to TLU. The Panel believes that a thorough and proper assessment of project effects on TLU and Aboriginal rights and interests is a complex undertaking, requiring an understanding and integration of a host of issues, including effects on the availability or abundance of the resources important to Aboriginal people as well as the combined effects of noise, odours, barriers to access, perceived contamination of the resources, cultural factors, and other issues.

[1269] In light of the above issues, the Panel finds it is unable to rely on the significance determinations provided by Shell for project and cumulative effects to Aboriginal TLU and Aboriginal and treaty rights. The Panel has therefore completed its own assessment of significance based on the information provided by Shell and the Aboriginal groups.

[1270] The Panel notes that according to Shell's assessment, the Project will have a direct and adverse effect on the four RFMAs immediately surrounding and adjacent to the Project. The total amount of disturbance within the RFMAs in the application case ranges from 53 to 67 per cent with the Project accounting for 22, 13, 6, and 19 per cent of the disturbance in RFMAs 1714, 1716, 2137, and 2172, respectively.

[1271] The Panel understands that Shell has or will enter into compensation agreements with the RFMA holders to address impacts resulting from the Project and notes that this is necessary to mitigate the potential effects to the RFMA holders. However, the Panel does not believe that compensation agreements with the RFMA holders provide mitigation for project effects on the TLU of other Aboriginal users of the trapline areas or potential effects on Aboriginal or treaty rights. The Panel recognizes that the MCFN, FMFN, and FMMCA have signed agreements with Shell which address their project-specific concerns, however not all of the Aboriginal groups that participated in the hearing have signed such agreements with Shell.

[1272] The Panel notes that the amount of land that is or will be unavailable for TLU within the various FMFN CSEs in Shell's terrestrial RSA are significant, ranging from 19 to 55 per cent of the areas as summarized in the table below. The Panel recognizes however that the Project accounts for only 1 to 3 per cent of the loss.

	Amount of Disturbance (per cent of CSEs)					
	Base Case		Application Case		Planned Development Case	
CSE	Moderate Use	Intense Use	Moderate Use	Intense Use	Moderate Use	Intense use
All Traditional Use	29	31	31	31	37	36
Big Game Harvesting	19	30	19	32	21	39
Traditional Plant Harvesting	31	47	34	47	42	55

[1273] The Panel notes that when assessing the total amount of disturbance for the base case, application case, and PDC and the potential of this disturbance to result in cumulative effects to TLU activities, Shell compared the amount of disturbance to the entire traditional territories of ACFN, FMFN, and MCFN. Using this comparison, Shell estimated the percentage of traditional territory to be disturbed in the application case as approximately 6, 11, and 19 per cent of the traditional territories for MCFN, ACFN, and FMFN, respectively. The amount of disturbance predicted by Shell increases to 7, 13, and 22 per cent for MCFN, ACFN, and FMFN, respectively, in the PDC.

[1274] The Panel notes that the traditional territories of MCFN, ACFN, and FMFN used by Shell are very large and range in size from approximately 3.5 to 8.6 million ha (35 000 km^2 to 86 000 km^2). The Panel does not believe that comparing the amount of disturbance to such large areas is an appropriate basis for determining significance as not all areas of the traditional territory may be readily available to traditional land users. The Panel notes that if, instead of using the entire traditional territory of the First Nation, Shell had used the amount of traditional territory located within the terrestrial resources RSA as the basis for comparison, the amount of disturbance would be significantly higher: 33, 35, and 31 per cent in the application case for MCFN, ACFN, and FMFN, respectively and 39, 41, and 37 per cent in the PDC. These values suggest a much higher potential for significant effects to TLU.

[1275] The Panel recognizes that the majority of the expected disturbance and loss of areas available for TLU activities predicted by Shell exist in the base case and are associated with projects and anthropogenic disturbances that already exist or have been previously approved as well as natural disturbances which may already exist or may occur in the future. The Project will make an additional but modest contribution to the expected level of disturbance.

[1276] The Panel understands that ultimately these disturbed areas will be reclaimed and become available once again for TLU activities. However, for many projects, significant reclamation will not occur until late in the life of the project and then it will still be years to decades before the land is reclaimed and land use restored. The Panel therefore believes that the effects of the Project and other oil sands projects will persist for at least several decades and this has significant implications for the sustainability of TLU practices in the interim.

[1277] The Panel does not believe that the mitigation measures proposed by Shell will address the loss of traditional use during this interim period.

[1278] The Panel also found that some effects, such as adverse effects on wetlands, may not be reversible so there is a possibility that some project-related cumulative effects on traditional resources and TLU will occur for an indefinite period of time.

[1279] The Panel did not agree with Shell's assessment of the significance of project effects to several terrestrial resources important for TLU. The Panel found significant adverse project effects to wetlands, traditional plant potential areas, wetland-reliant species at risk, migratory birds that are wetland-reliant or are species at risk, and biodiversity. The Panel also found that the Project was likely to result in adverse, but not significant project effects to caribou, wood bison, and moose.

[1280] The Panel finds that the Project will result in the loss of lands and some terrestrial resources used for TLU activities and this will have an impact on some Aboriginal people that currently use the Project area. The Panel finds that the mitigation measures proposed by Shell are not sufficient to fully mitigate these effects. The Panel believes however, that project effects alone are unlikely to destroy or fundamentally alter the ability of the Aboriginal groups to practice TLU activities or exercise their rights and, therefore, finds that project effects, while adverse, are not likely to be significant.

[1281] The Panel notes that all of the Aboriginal groups, including those that withdrew their objections to the Project, have expressed concern about the assessment and management of cumulative effects in the oil sands region and the potential impact of these effects on their TLU, Aboriginal and treaty rights, and culture.

[1282] The Panel did not agree with Shell's assessment of the significance of cumulative effects to several terrestrial resources important for TLU. The Panel found that the Project, in combination with other existing, approved, and planned projects and other activities was likely to result in significant adverse cumulative effects to wetlands, old-growth forests, traditional plant potential, biodiversity, wetland-reliant species at risk and migratory birds, old-growth-reliant species at risk and migratory birds, and caribou.

[1283] The Panel recognizes that there is considerable uncertainty associated with the amount of disturbance predicted in the base case, application case, and PDC, the associated loss of wildlife, plant, or other resources that will be lost as a result of this disturbance, and the significance of these effects on TLU. For example, in the base case, not all of the projects have been built yet and so not all of the predicted disturbance or loss has occurred. Similarly, for those projects that have been constructed, not all of the disturbance will occur at once, particularly for the large mining projects which experience a phased development over time. In the application case and PDC, the predicted disturbance or loss includes losses resulting from natural disturbances (such as forest fires) which may or may not occur and in any event will tend to recover more quickly than other types of disturbance, such as oil-sands-related disturbances. The level of disturbance or threshold at which the effects to resources will have a significant or permanent effect on TLU is also uncertain.

[1284] Notwithstanding the uncertainties associated with assessing project and cumulative effects, the Panel finds that the Project, in combination with other existing, approved, and planned projects is likely to result in significant adverse cumulative effects to TLU activities, including hunting and gathering. The Panel finds that significant areas already have been or will be lost for the purposes of TLU as a result of existing, approved, and planned activities, as well as natural disturbances and other resources important for the practice of Aboriginal TLU, rights, and culture. Wetlands, old-growth forests, traditional plant potential, migratory birds, and wildlife species such as caribou have been or will be subject to significant adverse cumulative effects. The Panel recognizes that disturbed areas will eventually be reclaimed, but this will not occur for many years, some types of habitat cannot be reclaimed, the landscape will be significantly altered, and some species loss may be irreversible. The long-term and possibly irreversible nature of these effects has significant implications for the sustainability of TEK, TLU practices, Aboriginal and treaty rights, and culture.

[1285] The Panel acknowledges and understands the traditional and cultural importance of caribou, wood bison, and moose to the Aboriginal groups. The Panel notes that the clearing of the Project area will reduce habitat availability for all three species and result in increased difficulties accessing the species by TLU practitioners.

[1286] The Panel has already noted that caribou appear to be declining to extirpation in the RSA due to the direct and indirect effects of industrial development. The Panel finds that Shell and the Aboriginal groups provided conflicting information on how important the habitat in the LSA is for caribou in the region. The Panel believes that while there is evidence that caribou still do use the LSA to some limited extent, the numbers of caribou using the LSA are likely to be low, given the population decline that has already been experienced and the amount of disturbance that has already occurred. The Panel concluded that project effects to caribou were likely to be adverse, but not significant based largely on the apparent already low use of the LSA. The Panel recognizes however that historically caribou were much more abundant in the area and are no longer available in quantities sufficient for traditional use. The Panel therefore concluded that significant adverse cumulative effects to traditional use of caribou have already occurred and these effects will continue in the application case and PDC. The Panel has included a number of recommendations to the Governments of Alberta and Canada that relate to the management of woodland caribou.

[1287] The Panel found that the Project is likely to affect some wood bison habitat used by the Ronald Lake Herd due to construction of the Redclay Compensation Lake. The Panel notes however, that habitat loss is not the greatest threat to wood bison; disease is a more significant threat. The Panel also notes that Shell and the Aboriginal groups provided little information about the abundance of wood bison in the area of the proposed Redclay Compensation Lake or the importance of the habitat that will be affected by the compensation lake. The Panel, therefore, concluded that both project and cumulative effects to wood bison were adverse, but not likely to be significant. For similar reasons, the Panel finds that project and cumulative effects to the Aboriginal groups' ability to hunt wood bison as a result of the Project are adverse, but not likely to be significant. The Panel has included a number of recommendations to Canada regarding completion of the federal recovery strategy and the identification of critical habitat for wood bison.

[1288] The Panel notes that there is an absence of reliable population data for moose in the LSA and RSA used by Shell. However, the Panel believes that there is some evidence to suggest a decline in moose populations from the PIC to the base case. The Panel also believes that changes in moose abundance and perceived changes in the quality of meat have already altered the traditional use of moose in the LSA. The Panel recognizes that post-closure, reclamation of the LSA may increase moose habitat; however in the interim, the Panel believes that Shell has not provided evidence to support its view that the adjacent RSA contains sufficient moose habitat to sustain moose populations and that there is no need to mitigate the loss of moose habitat within the LSA. The Panel also notes that Shell predicted moose populations in the RSA to decline further in the application case and PDC and as such, Aboriginal peoples' relationship with these species may be further affected.

[1289] In the absence of reliable population data for moose, the Panel concluded that Project and cumulative effects to moose were adverse, but not likely to be significant. For similar reasons, the Panel concluded that Project and cumulative effects to the Aboriginal groups' ability to hunt moose are adverse, but not likely to be significant. Due to the uncertainties associated with the size and trend of current moose populations and the importance of moose to the Aboriginal groups, the Panel has included a recommendation that the Government of Alberta develop and implement a program to monitor the health and long-term sustainability of moose populations in the Lower Athabasca region, either as part of the biodiversity management framework under *LARP* or as part of other monitoring initiatives currently being developed and implemented.

Navigation

[1290] The Panel notes that several of the Aboriginal groups raised concerns about low water levels in the Athabasca River and the PAD and the impact these low levels have on navigation, TLU, and the exercise of Aboriginal and treaty rights. The Panel acknowledges that changes in navigation may be occurring but believes the reasons for the observed changes are not clearly understood and are likely the result of a combination of factors, including but not limited to a discontinuation of dredging, the construction and operation of the Bennett dam, variation in water flows due to natural wet-dry cycles or climate change, and water withdrawals by oil sands operations and other upstream water users.

[1291] Based on Shell's commitment to complying with existing flow allocation restrictions outlined in the current *Water Management Framework for the Lower Athabasca River Phase 1* and with future Phase 2 conditions and the negligible effects from Project related water withdrawals on regional water flows, the Panel concluded that the Project was unlikely to result in significant adverse Project or cumulative effects to water levels or navigation in the Athabasca River or PAD. The Panel, therefore, also concludes that the Project is unlikely to result in adverse Project or cumulative effects to Aboriginal traditional use or Aboriginal or treaty rights resulting from adverse effects to navigation.

[1292] Although the Panel has determined that the Project is unlikely to result in any significant adverse effects to water levels or navigation in the Athabasca River or PAD, the Panel has included several recommendations in its report that address concerns raised by the Aboriginal groups related to water management and navigation, including that:

- the Governments of Canada and Alberta consider the precautionary cut-off flow approach to address impacts of water withdrawals during extreme low-flow conditions, and potential impacts on navigation.
- DFO, ESRD, the oil sands industry, and all other involved stakeholders dedicate the necessary resources to ensure that Phase 2 of the *Water Management Framework for the Lower Athabasca River* is completed and implemented in a comprehensive manner by January 2016 as recommended in the P2FC report;

[1293] The Panel also recommends that EC in collaboration with ESRD, conduct joint research, in collaboration with interested Aboriginal groups, and report on the causes of the perceived drying of the Athabasca oil sands region and the PAD, and that Aboriginal concerns on this issue be considered in any Phase 2 water allocations.

Effects on Culture

[1294] The Panel notes that Shell did not provide an assessment of the potential cultural effects of the Project to each First Nation or Aboriginal group as requested by the Panel in its January 30, 2012, SIR to Shell. The Panel also notes that Shell did not conduct individual interviews for its cultural assessment and there was no significant input or engagement by the Aboriginal groups to validate the approach or results of the assessment.

[1295] While Shell stated that the cultural assessment covers potentially impacted Aboriginal groups whose traditional territories overlap the Project area, including ACFN, MCFN, FMFN, FMMFN #468, and Métis Locals 63, 125, and 1935, the majority of information Shell relied on for the assessment appears to have been largely sourced from ACFN, MCFN, FMFN, and the RFMA holders. It is therefore unclear to the Panel to what extent Shell made use of or considered information from the other Aboriginal groups.

[1296] The Panel notes that Shell focussed its cultural assessment on an assessment of project effects and did not assess cumulative impacts to Aboriginal culture over time. In contrast, the cultural assessment information provided by some of the Aboriginal groups (most notably ACFN and FMFN) tended to focus less on the specific impacts of the Project and more on the cumulative impacts to and changes in culture over time.

[1297] The Panel agrees with Shell that assessing the effects of the Project on the tangible and intangible elements of culture is a complex exercise and many different approaches are possible. While Shell's cultural assessment provided only a broad assessment of these cultural effects and was not specific to any First Nation or Aboriginal group, it was still useful to the Panel. However, in order to more fully understand the project and cumulative effects on the culture of individual First Nation or Aboriginal groups, the Panel made use of the information provided by those First Nation or Aboriginal groups.

[1298] The Panel notes that Shell found the effects of the Project on the tangible and intangible elements of culture to range from negligible to moderate. Shell's assessment relied in large part on the linkage analysis and discipline-specific results contained in the EIA which found that the Project was unlikely to have significant adverse effects on resources used by Aboriginal groups, including on lands available for TLU activities. Because Shell did not expect the Project to have significant adverse effects on the biophysical resources important to Aboriginal groups at a regional scale or within the TLU-RSAs, Shell concluded that the Project was also unlikely to have significant adverse effects on Aboriginal culture.

[1299] As discussed above, the Panel does not agree with some of Shell's significance determinations and believes that the Project is likely to result in adverse, but not significant project effects on TLU. The Panel agrees, however, with Shell's assertion that the effects of the Project alone are unlikely to have a significant adverse effect on Aboriginal culture.

[1300] Although Shell did not provide an assessment of the cumulative impacts to Aboriginal culture over time, Shell acknowledged that the effects of development and other activities within the RMWB have had a significant effect on Aboriginal culture over time, with some effects being positive and others negative, and that these effects are likely to increase in the future.

[1301] The Panel has determined that the Project, in combination with other existing, approved, and planned projects, as well as other activities occurring in the RMWB is likely to result in significant adverse cumulative effects on TLU. Because Aboriginal culture is closely tied to TLU activities and the exercise of Aboriginal and treaty rights, the Panel therefore concludes that the Project, in combination with other existing and planned development and activities, is also likely to result in significant adverse cumulative effects on Aboriginal culture. The increased loss of lands and resources available for the practice of TLU activities has significant implications for the sustainability of TLU and cultural practices. Some of the cumulative socioeconomic effects associated with regional development, such as increased access to the wage economy, the availability and high cost of housing, and significant increases in the regional population, will further contribute to the cultural changes within the Aboriginal groups in the RMWB.

Conclusions

[1302] The Panel acknowledges that not all Aboriginal groups will experience Project or cumulative effects to TLU, Aboriginal and treaty rights and culture in the same manner, or to the same degree. The significance of effects will depend in part on how the members of that group use the immediate Project area and the broader region surrounding the Project. The potential for Project and cumulative effects to adversely impact the TLU, Aboriginal and treaty rights, and culture of each Aboriginal group is discussed in the sections that follow.

[1303] The Panel believes that completing CEAs is a very challenging and complex exercise, particularly for effects to Aboriginal TLU, rights, and culture. The number and variety of projects and activities occurring in the oil sands region, the multiplicity of traditional uses, rights, and cultures associated with the different Aboriginal groups, and a lack of consensus on the appropriate thresholds to be used for determining when significant adverse effects to Aboriginal TLU, rights, and culture might be occurring make it difficult for the proponents of individual projects, such as Shell, to conduct these assessments. It also makes it very challenging for the Panel to assess the adequacy of the CEA and the significance of the cumulative effects predicted. The Panel agrees with Shell and the Aboriginal groups that completing CEAs at a regional, rather than on a project-by-project basis, would be more effective and would reduce the potential for individual project CEAs to produce inconsistent results.

[1304] It is also apparent to the Panel that the mitigations being proposed by individual project proponents are not effective at mitigating the adverse cumulative effects to TLU. While the stated intent of *LARP* is to take more of a cumulative effects approach to managing environmental effects in the Lower Athabasca Region, the Panel notes that *LARP* does not specifically address TLU issues but instead provides for continued consultation and engagement with Aboriginal peoples to help inform land and natural resource planning in the region. Several of the Aboriginal groups expressed concern that the *LARP* does not address their concerns and does nothing to ensure ongoing traditional use of the land. The absence of a management framework and associated thresholds for TLU makes it very difficult for both industry and panels such as this one to evaluate the impact of individual projects on TLU. The Panel believes that to be better able to accomplish this and inform land use planning, a TLU management framework should be developed for the Lower Athabasca Region. The Panel recommends that Alberta develop and implement a TLU management framework for the Lower Athabasca region as a component of the *LARP*. The Panel recommends that the Government of Alberta develop this framework in conjunction with the Government of Canada, other stakeholders, and all Aboriginal people affected by industrial development that practice their rights in the oil sands region. The Panel recommends that this framework be maintained and adapted over time to ensure the protection of Aboriginal land use and treaty rights in the oil sands region.

[1305] At the outset of the hearing, the Panel determined that it did not have the jurisdiction to rule on the adequacy of Crown consultation, and in any case that it would be premature for the

Panel to make that decision as there will be further opportunities following the issuance of the Panel's report and before Crown decisions are made or authorizations issued for the Project. The Panel notes that both Alberta and Canada stated in the NQCL process that the consultation process was not yet complete and that there would be additional opportunities for consultation after the Panel's report had been completed and before Crown decisions or regulatory authorizations were issued for the Project. The Panel recommends to the Governments of Alberta and Canada that before other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with each of the Aboriginal groups in light of the issues identified in this report to determine whether additional consultation is necessary to address these issues, including likely significant adverse Project and cumulative effects to a number of resources important to Aboriginal people and likely significant adverse cumulative effects to Aboriginal TLU, rights and culture.

Athabasca Chipewyan First Nation

Evidence

Participation and Requested Disposition

[1306] ACFN's participation in the review process and hearing is discussed in the Participant Involvement in the Review Process section.

[1307] ACFN stated that it opposed the Project because it believes that the Project will cause significant adverse effects on ACFN's traditional knowledge and land-use activities, Aboriginal and treaty rights, and culture. ACFN also argued that the EIA has significant gaps, the mitigation proposed by Shell does not address the concerns ACFN raised, and consultation by both Shell and the Crown has been inadequate. It said that the Project is not in the public interest.

[1308] ACFN asked that the Panel not approve the Project and that a five-year moratorium be imposed on further oil sands development while proper planning is completed and put in place. ACFN stated that this planning must recognize and respect ACFN's Aboriginal and treaty rights and that ACFN wants to participate in the planning.

[1309] ACFN asked that if the Project were approved, the Panel recommend to Alberta that a traditional resource use management plan (TRUMP) be completed before any approvals are issued for this Project or other industrial developments. It asked that the TRUMP include binding thresholds and measures that will allow regulators to condition permits and authorizations in a manner that protects Aboriginal and treaty rights.

[1310] ACFN also asked the Panel to call for an independent commission of experts to be established with the purpose of evaluating consultation and accommodation of impacts in the oil sands region.

[1311] Appendix 8 provides a list of ACFN's key recommendations.

Rights Being Asserted

[1312] ACFN asserted that it is a successor to an Aboriginal group that entered into Treaty 8 and that it has the right to hunt, trap, fish, and gather on all unoccupied Crown lands and other lands for which they have right of access.

[1313] ACFN also asserted that its rights include incidental rights required to meaningfully exercise its treaty rights, including

- routes of access and transportation;
- sufficient water quality and quantity;
- sufficient quality and quantity of resources in preferred harvesting areas;
- cultural and spiritual relationships with the land;
- abundant berry crops in preferred harvesting areas;
- traditional medicines in preferred harvesting areas;
- the experience of remoteness and solitude on the land;
- construction of shelters on the land to facilitate hunting, trapping, gathering, and/or fishing;
- use of timber to live on the land while hunting, trapping, gathering, and/or fishing (e.g. to build shelters and fires);
- the right to instruct younger generations on the land;
- access to safe lands within which to practise rights;
- the right to feel safe and secure in the conduct of such practices and activities;
- lands and resources accessible within the constraints of time and cost;
- sociocultural institutions for sharing and reciprocity; and
- spiritual sites and associated practices.

[1314] ACFN stated that as of August 2012, it had approximately 1049 members, about one fifth of them residing on reserve lands or Crown lands in the vicinity of Fort Chipewyan. The majority of other ACFN members reside on other First Nation reserves or in Fort McMurray, Edmonton, Fort McKay, and Fort Smith. ACFN noted that its population had increased by almost 50 per cent from 2000 to 2012, representing an annual growth rate of approximately 4.2 per cent.

[1315] ACFN stated that while Fort Chipewyan is the economic and administrative centre for ACFN, its cultural heartlands, where it exercises its treaty and Aboriginal rights, lie farther south. ACFN explained that it has eight reserve areas in the Athabasca Delta, on the south shore of Lake Athabasca in the vicinity of Fort Chipewyan, upstream along the Athabasca River at Point Brule and at Poplar Point (approximately 27 km northwest of the Project). ACFN also stated that it is currently seeking to set up a new community on the south shore of Lake Athabasca at Old Fort Point.

Adequacy of Consultation by Shell

[1316] Shell stated that it had a 15-year history of consulting and working with ACFN and believed that it had a good understanding of the issues and concerns ACFN raised about the Project. Shell acknowledged that its relationship with ACFN had become more adversarial recently. Shell and ACFN agreed, however, that Shell had consulted and negotiated in good faith but could not agree on one aspect of the measures necessary to mitigate the effects of the Project. ACFN said that the details of the negotiations were confidential.

[1317] ACFN expressed concern about the Aboriginal consultation plan developed by Shell and approved by AENV. ACFN stated that the consultation plan does not address how ACFN's input will be substantially considered and addressed on TLU, TEK, socioeconomic issues, and potential direct, indirect, and cumulative impacts on ACFN's ability to meaningfully exercise its Treaty 8 rights, now and in the future.

[1318] Shell stated that while it had asked ACFN how it would like to be consulted regarding the Project, Shell could not confirm whether it had consulted with ACFN specifically about the consultation plan. Shell noted that ESRD had approved the consultation plan and confirmed that it had been provided to ACFN.

[1319] ACFN noted that the consultation plan states: "by assessing the strength of claim, Shell is able to engage more appropriately with those groups that may be directly impacted by the project." Shell stated that it had not conducted a formal assessment of the strength of claim of ACFN, but based on Shell's 15-year history of consulting with ACFN, Shell believed that it understood ACFN's concerns and acknowledged that there was the potential for the Project to affect ACFN's Aboriginal and treaty rights.

[1320] ACFN submitted that the Crown, and not Shell, is a signatory to Treaty 8 and no one requires Shell to substantially address ACFN's concerns and rights. ACFN expressed concern that neither Shell nor the Crown have informed themselves of what is required to sustain ACFN's Aboriginal and treaty rights. ACFN argued that Shell has moved beyond simply being a procedural delegate by determining what consultation is required and what mitigation is necessary, and that this is not appropriate.

[1321] ACFN was concerned that there was more focus in Shell's bimonthly consultation reports that it submitted to ESRD on the tracking of administrative details associated with the consultation process than on tracking substantive issues such as ACFN concerns and how they had been addressed or mitigated. ACFN stated that it believes that the consultation reports are misleading and do not provide ESRD with the information that it requires to assess the adequacy of consultation. ACFN stated that the consultation reports contain items that are not related to the Project and PRM, do not always accurately capture the issues, and do not give an accurate impression of what has occurred, why it has occurred, and whether or not issues are progressing or resolved. ACFN argued that the consultation logs were not meeting their intended purpose. ACFN also argued that the substantial length of the record and the consultation reports do not mean that meaningful consultation has occurred.

[1322] Shell stated that the consultation information is summarized to meet ESRD's requirements and that if ESRD requests additional information, Shell provides it. Shell said that

ESRD had requested additional information on items in the consultation reports. Shell also noted that the consultation reports are provided to the First Nations for review and comment.

[1323] Shell stated that, as a delegate of the Crown with respect to the procedural aspects of consultation, it provides these consultation reports, recognizing that they are just one source of information for any assessment of the adequacy of consultation and the potential effects of the Project on Aboriginal and treaty rights.

[1324] ACFN expressed concern that there was no way for ACFN to know what Shell and ESRD discussed with respect to consultation respecting ACFN. Shell responded that the issues discussed with AENV would be summarized in the detailed meeting notes that it shared with the Aboriginal groups.

[1325] ACFN expressed concern about the extent to which Shell considered and incorporated information provided by ACFN into the assessment and design of the Project. ACFN stated that it had provided thousands of pages of technical review documents and traditional use information to Shell, but that this information has not resulted in any changes to Shell's plans. ACFN stated that its core concerns remain and that Shell had not substantially addressed them.

[1326] ACFN stated that its *IKLU Report* shows significant use in the Project area and states that there will be a significant adverse effect on Aboriginal rights. ACFN expressed concern that despite this report, Shell did not change its assessment and did not incorporate ACFN's views.

[1327] Shell stated that some of the areas listed in the *IKLU Report* as being within the Project footprint or within 250 m of it were actually outside of those areas.

[1328] Shell provided some examples of where it had modified its plans for the Project based on ACFN and other Aboriginal stakeholders' input. Shell stated that the original plans for the Project involved the temporary diversion of the Muskeg River through a pipeline. In response to concerns about the pipeline diversion from Aboriginal groups, Shell developed and submitted the MRDA mine plan that uses an open channel diversion of the Muskeg River. Shell stated that it did this to address Aboriginal concerns related to the navigability of the river, maintaining the spirit of the river, and protecting water quality in the downstream reaches of the river. Shell stated that it used ACFN and other Aboriginal groups' input to inform reclamation planning activities on its existing mines and the input is already being incorporated into reclamation and closure planning activities for the Project. Shell stated that it had made a commitment that ACFN members would be involved in the collection of seeds for traditional plants and the planting of seeds during reclamation. Shell stated that it also used and will use ACFN and other Aboriginal groups' input for determining planting prescriptions. Shell stated that it used ACFN input in the development of the NNLP, including the determination of species distribution and species preferences. Shell also stated that it augmented the NNLP to address human health concerns raised by ACFN and others related to the potential for methyl mercury to occur in the Redclay Compensation Lake.

[1329] Shell stated that it has considered the information provided by ACFN but that many of the issues raised are related to differences of opinion over assessment methodology and conclusions. Shell acknowledged that it and ACFN have differences of opinion with respect to these matters. Shell stated that although some individuals and activities will be affected by the Project, it considered the Project and its associated effects on a broader scale.

[1330] ACFN stated that it was not consulted about plans to change from a pipeline to an open channel diversion of the Muskeg River and it does not support that option. ACFN stated that it has significant unresolved concerns about the diversion of the mainstem of the Muskeg River and does not support mining through the river. ACFN stated that it believes that the Muskeg River should be protected.

[1331] Shell acknowledged that ACFN would prefer that Shell not disturb the river, but stated that the MRDA mine plan was an attempt to address ACFN and other Aboriginal groups' concerns in a substantive manner.

[1332] Shell stated that it had provided more than 300 responses to concerns raised by ACFN regarding how the Project has been designed. Shell argued that the fact that an interested party does not agree with the outcome does not mean the proponent has not attempted to address its concerns.

[1333] ACFN expressed concern about the lack of consultation and engagement by Shell on Shell's cultural assessment. ACFN noted that Shell began work on the assessment in June 2011 and submitted it to the Panel in May 2012. ACFN stated that it attempted to become engaged in the assessment of its culture, but Shell completed its assessment without ACFN input, instead using reports previously provided by the various First Nations.

Adequacy of Consultation by the Crown

[1334] ACFN stated that although the Crown secured the right to take up lands from time to time under Treaty 8, this right is subject to the Crown's duty to consult and accommodate ACFN's interests before reducing the area over which ACFN members may continue to pursue their hunting, trapping, and fishing rights. ACFN stated that this duty to consult and accommodate extends to ACFN's concerns about the cumulative effects of development on its traditional lands and the meaningful exercise of its treaty rights.

[1335] ACFN stated that the Crown has not addressed ACFN's concern that cumulative impacts of development throughout its traditional lands have threatened, or are threatening, ACFN's core entitlement to exercise its treaty rights on its traditional lands in perpetuity. ACFN said that failure to address this issue constitutes a breach of the Crown's consultation duties, and any approval in the face of such a breach is unlawful and invalid.

[1336] ACFN stated that it has made a concerted, sustained effort to alert the Crowns as well as the proponent, of the adverse impacts this Project would have on its Treaty 8 rights, both alone and in context of historic and ongoing encroachment on ACFN's treaty rights.

[1337] ACFN believed that the Crown has failed to engage in meaningful, project-specific consultation. ACFN said that it has a long-standing concern about the manner in which Shell represents its consultation activities with ACFN to the Government of Alberta. ACFN stated that it is also concerned that Alberta has been willing to adopt Shell's assertions without talking to ACFN even though it has alerted Alberta to omissions and misrepresentations in Shell's correspondence and consultation logs several times.

[1338] ACFN stated that there has been no follow-up by Alberta to discuss concerns identified in the consultation reports. Alberta has met with Shell quarterly to discuss the Project but has been unwilling to meet with ACFN since 2009. ACFN stated that it is not clear what Alberta does with the information it receives and Alberta did not participate in the hearing to speak to these issues. ACFN stated that federal witnesses could also not explain how Canada considered treaty rights in the assessment of project effects.

[1339] ACFN expressed concern that both Alberta and Canada have largely delegated consultation to industry. ACFN stated that Alberta is absent from consultation and Canada won't discuss substantive issues or rights. It said that neither level of government would discuss treaty infringement.

[1340] ACFN stated that it wrote to Indian and Northern Affairs Canada (now Aboriginal Affairs and Northern Development Canada (AANDC)) in November 2007 indicating that a CEA was required for its reserve lands and communities, particularly with respect to water levels in the Athabasca River. ACFN noted that no one from AANDC was at the hearing to confirm whether a response had been provided to ACFN.

[1341] ACFN stated that approval of the Project may breach ACFN's constitutional rights to consultation and accommodation with respect to its concerns. ACFN added that to date, the Crown has not consulted adequately, or at all, regarding the concerns described above.

[1342] ACFN stated that since the signing of Treaty 8, ACFN's traditional lands have shrunk and continue to shrink because of the development that is occurring, not only by the oil and gas industry, but also with municipalities, farmers, and other users. ACFN stated that all of their land is being taken up and there is a need for both levels of government to meet with ACFN to make adequate plans to protect the livelihoods of ACFN members. ACFN stated that despite many attempts by ACFN to engage Alberta and Canada, both levels of government refuse to consult with ACFN.

[1343] ACFN stated that it wrote to Alberta and Canada in February 2010 and on other occasions to raise concerns about the impact of oil sands development on ACFN's traditional lands and Aboriginal and treaty rights, the inadequate consultation related to these impacts, and what ACFN perceived to be a "downward spiral in relations" between ACFN and Alberta and Canada. ACFN stated in its February 2010 letter that in the absence of effective consultation, ACFN had been moving to protect its rights.

[1344] ACFN stated that it is frustrated because the recommendations of previous panels have been implemented only very slowly, or not at all, and ACFN does not believe that there is any protection for the environment or their Aboriginal and treaty rights.

[1345] ACFN stated that while there has been some discussion between ACFN and Alberta about a baseline community health study for Fort Chipewyan, progress has been very slow and frustrating for ACFN.

[1346] ACFN stated that it has also been frustrated in its attempts to engage both levels of government on positive solutions that could lead to reconciliation between ACFN and the Crown in respect of ACFN's goal of sustaining treaty rights in the face of industrial development. ACFN believes there are systemic flaws with consultation in the oil sands region.

[1347] ACFN stated that one systemic flaw is that the information and methodologies needed to properly assess impacts to treaty rights and culture are absent from the process. ACFN submitted that the assessments provided by proponents do not take into account the thresholds necessary to sustain ACFN's rights. It said that filling this gap is critical to ensuring that impacts to rights can be accurately characterized and to develop mitigation and accommodation measures that truly address those impacts. ACFN stated that it has proposed a solution to address this information gap, the development of a TRUMP. ACFN believes that a second systemic flaw is a lack of will by Shell and both levels of government to meaningfully address ACFN's concerns. ACFN stated that a third systemic flaw is that concerns expressed by ACFN in the context of project-specific consultations are often deferred to regional planning and cumulative effects processes and frameworks. However, ACFN's experience with respect to the consultation associated with these regional processes and plans is that they are often flawed and fall short of protecting treaty rights.

[1348] ACFN stated that it was not adequately consulted on the *LARP* as Alberta came to the community only once and the representatives that came were two junior staff members. ACFN submitted that the consultation by Alberta during the *LARP* process was "largely meaningless." ACFN stated that despite considerable time and effort invested by ACFN to prepare and provide input during the *LARP* process, it is not clear to ACFN how Alberta considered or incorporated its views into the *LARP*. ACFN wrote to Alberta on several occasions during the development of the *LARP* to express its concerns about the process being used for consultation and to stress the importance of ensuring that ACFN's constitutional and treaty rights were recognized and respected in the final plan. ACFN stated that it was not satisfied with the responses or level of engagement provided by Alberta in response to its many letters. ACFN stated that the *LARP* is not a framework to protect treaty rights, nor was it meant to be, and that the *LARP* does not adequately address ACFN interests and needs.

[1349] ACFN stated that it had participated in several other Crown-led processes, but there has been little incorporation of ACFN's concerns and ideas into these initiatives. ACFN stated that there is little incentive for ACFN to participate in regional processes when its input is not included. ACFN cited the example of its participation in the CEMA process considering water management in the Athabasca River. ACFN said that it identified serious deficiencies in the process and eventually needed to take the initiative to develop its own threshold for water flows in the Athabasca River, based on navigability, ABF.

[1350] ACFN stated that it eventually withdrew from CEMA because the CEMA groups were not able to resolve these issues to properly manage development in the region, and ACFN was upset that the things it had hoped to accomplish could not be accomplished through CEMA. ACFN submitted that where activities affect treaty rights, the provincial or federal government needs to take a leading role; industry cannot be left to manage these issues. ACFN acknowledged that since it left CEMA, CEMA had been reorganized and ACFN had heard some good things about it. ACFN suggested that it might consider rejoining CEMA in the future.

[1351] ACFN stated that capacity is a concern for ACFN and questioned the efficiency and effectiveness of continuing to do site-specific traditional use studies for each project. ACFN stated that it is frustrating for its elders as they are constantly being asked for the same information for each project. ACFN stated that implementing its agreements with the developers is also administratively exhausting as it has to respond to many applications, often with unreasonable timelines, leading to a feeling of being overwhelmed at times. ACFN stated that it had recently completed a review of its internal capacity that showed that it would need 37.5 full-time people to keep up with the growing regulatory burden, although it has only seven people.

[1352] Shell acknowledged the demands it places on ACFN's resources and noted that it had increased funding to the ACFN IRC to $160 000 in 2011.

[1353] ACFN believes that developing and implementing a TRUMP is necessary to ensure protection of and to provide the information necessary to effectively assess cumulative impacts to ACFN's Aboriginal and treaty rights. ACFN stated that it has tried to discuss comanagement of its traditional territories with Alberta on several occasions, but currently the province is unwilling to discuss it. ACFN reported that during the *LARP* process, it provided advice to Alberta on the possible role and benefits of a comanagement approach, which initially resulted in some interest from Alberta and Canada and a request for further information. ACFN prepared and submitted to the Land Use Secretariat responsible for the *LARP* a more detailed discussion paper on comanagement concepts and how a co-management model might work. ACFN reported that both Alberta and Canada continued to show interest in the proposal after receiving the discussion paper. However, ACFN stated that it was very discouraging that late in the *LARP* process, Alberta withdrew suddenly from further discussions about TRUMP with no explanation and finalized the *LARP* without incorporating a comanagement element.

[1354] ACFN stated that it is not against industrial development, but favours sustainability and slow growth rather than growth at a pace that is uncontrollable. ACFN stated that the current pace of growth is too fast and there has not been proper planning for this growth, resulting in several adverse impacts on the communities in the oil sands region. ACFN stated that the consultation and regulatory processes governing oil sands development are "broken" and failing ACFN.

[1355] ACFN expressed concern that the federal Crown considers the hearing to be part of the consultation process. ACFN said that it believes that both levels of government should have information on potential impacts on rights earlier in the process. ACFN noted that Alberta did not participate in this hearing, but will be making approval decisions resulting from this proceeding.

[1356] During final argument, Canada disagreed with ACFN's assertion that it had not considered the impact of the Project on treaty rights. Canada stated that the evidence filed by ACFN includes a significant amount of correspondence between ACFN and the federal government, including DFO. Canada argued that the correspondence, Canada's submissions, and the information provided by DFO show that DFO did consider the information provided by ACFN. Canada also noted that TC's submission makes specific reference to impacts on Aboriginal rights.

[1357] Canada argued that many of ACFN and other Aboriginal groups' recommendations are very broad and in some cases only remotely related to project-specific effects. Canada stated that the regulatory process is well suited to address issues that are site- or project-specific but is not intended or designed to address larger issues, such as the overall impact of development on a regional basis on the rights exercised throughout the region. Canada also noted that the Agreement requires the Panel to make findings of fact and provide recommendations with respect to the effects of the Project on Aboriginal and treaty rights asserted by the participants and that the Panel's findings and recommendations may assist the Crown in its consultation process.

Effects on Traditional Land Use, Rights, and Culture

EIA Methodology

[1358] ACFN believed that Shell confused trappers' rights with Aboriginal rights and that this confusion influenced Shell's assessment of project effects on ACFN's TLU and rights. ACFN stated that this confusion, in combination with a lack of appropriate data, contributed to an underestimation of project effects on ACFN and resulted in inappropriate mitigation measures.

[1359] ACFN stated that the trappers are not, in general, considered as holders of any specific knowledge about the TLU of ACFN. ACFN also stated that the resources gathered on a trapline or elsewhere by land users are shared within the community and that this is part of ACFN culture.

[1360] ACFN stated that it provided reports to Shell describing its land use in an LSA and RSA that it defined. ACFN defined its LSA as an area within 5 km of the Project footprint, including the mine site and associated works, within which direct interactions between the Project and ACFN values may exist. ACFN stated that its RSA includes a broader area within which both direct and indirect effects of the Project may be anticipated, such as noise, dust, odours, access management issues, traffic, effects on water, and other effects. The RSA defined by ACFN included the PAD.

[1361] ACFN disagreed with Shell that an assessment of the significance of effects on resources important to traditional users and on access to such resources could be used as a proxy for assessing the significance of the effects on TLU. ACFN noted that the biophysical and socioeconomic receptors and indicators included in the EIA are based upon principles of biodiversity and ecosystem integrity and not on parameters of Aboriginal use or values. Similarly, the socioeconomic assessment in the EIA is based upon an assessment of mainstream economic activities and not on the First Nation's traditional and cultural social economy. ACFN stated that an assessment of these biophysical and socioeconomic receptors and indicators could not capture the impacts of the Project on ACFN's Aboriginal and treaty rights. ACFN believed that an impact assessment on ACFN should be based on a methodology that specifically assesses its rights.

[1362] ACFN stated that because of these methodological issues, Shell's EIA does not accurately depict the direct adverse and cumulative effects of the Project on ACFN's TLU, treaty, and Aboriginal rights. ACFN said that Shell's approach was flawed in assuming that that there would be no significant adverse effects on TLU if there were no significant adverse effects on the individual resources used by ACFN members or if these resources were available elsewhere within ACFN's traditional territory. ACFN also stated that Shell generally found project effects to be negligible because Shell assumes that they are reversible. ACFN believed that impacts to wetlands and other habitats are not reversible.

[1363] ACFN expressed concern that the information it provided to Shell did not change the results of Shell's assessment or its conclusions. ACFN stated that Shell has had ACFN's *IKLU Report* since January 2011 and that the report indicates the Project will result in significant adverse effects on ACFN's TLU and Aboriginal and treaty rights. ACFN stated that because of the approach and methodology employed by Shell, it was hard to imagine what kind of other information ACFN could have provided that would have changed Shell's assessment.

[1364] ACFN said that Shell did not rigorously measure the impacts on First Nations' traditional resources in any part of its assessment. ACFN also submitted that the regulatory process does not fund ACFN's ability to gather the kind of specific information that would contribute to an assessment of such impacts and that AENV had declined to include in the EIA TOR several measures that would have contributed to the assessment of potential impacts on ACFN section 35 rights. ACFN stated that in the absence of specific data, measures, thresholds, and criteria to assess impacts on Aboriginal rights, it is difficult to understand Shell's assertion that it has assessed such impacts.

[1365] ACFN submitted that Shell placed an inappropriate reliance on far future and uncertain reclamation activities to mitigate project effects on the environment and TLU. With respect to traditional knowledge and land use, ACFN considered the loss of an area for more than one generation to be permanent.

[1366] ACFN argued that the Panel's TOR requires consideration of mitigation measures that are technically and economically feasible but that many of Shell's mitigation measures rely on adaptive management which is often no more than a general commitment to do something if it becomes necessary. ACFN said that the issue of adaptive management has been addressed by the courts that have found that vague hopes for a future technology do not constitute mitigation. ACFN argued that assertion of unidentified mitigation measures as part of adaptive management is not a substitute for a commitment to specific mitigation measures.

Traditional Land Use

[1367] ACFN's updated *IKLU Report* provided baseline information regarding ACFN's traditional knowledge and use in the area of Shell's two proposed projects. The report was based on more than 100 interviews with 50 ACFN elders and land users and information compiled from previous studies.

[1368] ACFN stated that the Project is located within the area identified by ACFN as the Fort McKay proximate zone, an area that includes lands and waters relied upon by ACFN members living in and around Fort McMurray and Fort McKay. ACFN stated that the area was relatively undisturbed until the intensification of oil sands activities in the late 1990s.

[1369] ACFN indicated that its members have lived in the Project area from preindustrial time. ACFN indicated that the Aboriginals who lived in the area carried on traditional activities around Kearl Lake such as hunting, gathering berries, and drying meat. In particular, ACFN noted that its members have relied on the resources of the Kearl Lake area, such as moose, rabbit, and grouse. According to ACFN, in more recent times the resources gathered from trapline areas in the Kearl Lake area have been commonly shared with elders and other members of the community, and therefore, benefit more people than just the cabin or trapline holders.

[1370] ACFN reported that RFMA 1714 is the closest ACFN area (trapline or reserve) accessible by road from Fort McMurray and Fort McKay and that this RFMA has historically been a focal area for ACFN use. ACFN said that although this trapline is in an area that has already been impacted by industrial development, it is important to ACFN use because it is readily accessible in terms of the distance from settlements and the fact that no specialized equipment (such as boats and snowmobiles) is required to access much of it.

[1371] ACFN members provided evidence showing historic trapping by members in the Kearl Lake area. They provided evidence that ACFN members often receive their traplines through kinship relations. According to ACFN, the traplines are to some extent "shared land" and ACFN members, other than the trapline holder, may gather resources on the trapline.

[1372] ACFN stated that a variety of uses shown in the *IKLU Report* will disappear if the Project is approved. ACFN reported 68 site-specific values inside or within 250 m of the Project footprint including 33 subsistence sites, 14 habitation sites, 3 cultural or spiritual sites, 6 transportation sites, and 19 environmental features. It identified 122 specific-use values within the LSA defined by ACFN.

[1373] ACFN said that with respect to traditional knowledge and land use, place matters; specific locations and resources are important and traditional resource users cannot just go somewhere else. ACFN stated that there are also spiritual values associated with the land, including the area of the Project footprint, where people go to practise their rights and culture.

[1374] ACFN expressed concern that Shell seems to think that it is acceptable for traditional resource users to have to go elsewhere without assessing the availability or accessibility of areas elsewhere in ACFN's traditional territory. ACFN stated that it is problematic for the traditional users of the Kearl Lake area to find another place to exercise their rights partly due to the diminishing resource base and decreases in vacant public land. ACFN noted that increases in human population in the area and the drying of the PAD region further exacerbate the problem. ACFN members noted that they have to exercise their rights close to where they live because they cannot travel far to practise their rights and still be available for the jobs that they have in the area. They also indicated that they now have to carry water because of concerns regarding surface water contamination thus impeding how far they can travel on the land.

[1375] ACFN completed an analysis of the project-specific and cumulative effects of Shell's projects on ACFN TLU in the report *Effects on Traditional Resources of the Athabasca Chipewyan First Nation: The Shell Jackpine Mine Expansion and Pierre River Mine Project*.

[1376] The report found that as of 2008, about 28 per cent of the ACFN RSA had been disturbed by industrial developments. ACFN predicted that the cumulative effects of existing and anticipated development, including the Project, would remove any undisturbed land from the ACFN RSA by about 2042. Key findings from the report include the following:

- The ecosystem in the ACFN RSA may have already shifted to a different state, particularly where it overlaps with oil sands leases; the landscape now consists of very many small, isolated patches of natural surfaces. Further development is almost certain to push the ecosystem into a substantial and long-term that would constitute an ecosystem or regime shift.
- Bison and caribou have been virtually removed from the ACFN RSA and from most areas of the RMWB and are scarcely available for traditional resource use.

- In the past 16 years, an average of 42 km^2 (an equivalent of up to about 10 moose home ranges) or 1.1 per cent of moose habitat has been removed each year from the ACFN RSA. The decline in habitat directly translates to the decline of moose population density from 0.4 moose per km^2 in the 1970s to 0.1 in the region of the oil sands leases presently.
- In the past 16 years, beaver habitat experienced a yearly loss of 6.3 km^2 or 0.6 per cent of the 1100 km^2 available in 1992. Waterfowl habitat experienced a yearly loss of 3.6 km^2 or 0.2 per cent of the 1 564 km^2 available in 1992.
- The disturbed areas are unlikely to be reclaimed. There is very little similarity in terms of species composition between reclaimed sites and natural stands. Reclaimed sites show an unnaturally low diversity of species.
- The environmental assessment process for Alberta oil sands projects does not involve any objective quantification of traditional resources. There is no evidence that the impacts on First Nations' traditional resource use are rigorously measured in any part of the assessment process.

[1377] Shell's evidence indicated that between 11 and 13 per cent of ACFN's traditional lands would be disturbed within the terrestrial RSA, depending on the case selected. ACFN was of the opinion that comparing the disturbance in the Project area to the terrestrial RSA or the total surface area of its traditional territory underestimates the effects of the Project.

[1378] According to ACFN, Shell's estimate that terrestrial vegetation decreased by 20 per cent from the PIC to the base case but would decrease by only another 9 per cent in the next 50 years due to planned developments is unreasonable. ACFN stated that the underestimation of future change is likely caused by the omission of many currently undisclosed disturbances, such as disturbances from some finer scale developments and activities such as linear features, exploration activity, cut blocks, and infrastructure development.

[1379] ACFN noted that to mitigate project effects on TLU, Shell proposed to:

- provide compensation to directly affected RFMA holders,
- continue consulting with key Aboriginal groups, including ACFN,
- facilitate access across the Project area by trappers to their traplines,
- provide cultural diversity awareness training to Shell employees and contractors, and
- conduct ongoing consultation with key Aboriginal groups and participate in regional planning initiatives to ensure closure and reclamation plans consider the long-term sustainability of TLU activities.

[1380] ACFN stated that the proposed measures do not provide appropriate mitigation for the effects of the Project on the exercise of ACFN's rights. ACFN disagreed that Shell's proposed compensation to trapline holders is an appropriate mitigation for adverse effects on Aboriginal TLU or Aboriginal and treaty rights.

[1381] ACFN stated that it is uncertain whether the landscape can be reclaimed and even if it can, a successfully reclaimed landscape would no longer have any cultural significance for its people. According to ACFN, the effects of the Project on ACFN's TLU would be permanent and of high magnitude.

[1382] ACFN stated that the Project would contribute to already significant cumulative effects in the region that threaten ACFN's way of life. ACFN expressed concern that cumulative effects are not effectively addressed in the context of specific projects and every proponent takes the position that these cumulative impacts are not the result of its project.

[1383] ACFN's assessment of cumulative effects predictions in the *IKLU Report* indicates that, at the regional scale, cumulative effects will have high environmental consequences on traditional resources such as moose and furbearers. ACFN stated that it already considers there to be significant cumulative effects on these resources. ACFN also documented more than 215 site-specific cultural or spiritual values within its RSA and said that some or all of these values were likely to be adversely affected by the Project in combination with already existing disturbances.

[1384] ACFN said that perceived contamination of traditional food and water, including plants and animals, will further contribute to avoidance of use. ACFN stated that the Project would further contribute to ACFN's observed changes in water quality and quantity, adversely affect some or all of its ceremonial and major burial places, and affect its medicine collection activities.

[1385] ACFN stated that the tipping point, when the lands can no longer support the livelihood of the First Nation, must be determined before the true impacts can be assessed. The amount and nature of the resources needed in order to maintain its members' Aboriginal lifestyle and culture must be determined in order to assess the impact on their Aboriginal and treaty rights.

[1386] ACFN advocated for the development of a TRUMP that could be used to address cumulative impacts on TLU, Aboriginal and treaty rights, and culture. ACFN indicated that the TRUMP would be similar to a cumulative effects management framework for treaty rights and would identify the resource thresholds and criteria required to assess impacts on Aboriginal and treaty rights. ACFN suggested that the TRUMP would go further than conventional traditional-use studies because the TRUMP would also address the importance of the traditional activities in terms of the social, economic, and cultural health and wellbeing of ACFN members.

[1387] According to ACFN, oil sands development presents a significant threat to ACFN's ability to maintain its traditional practices and distinct culture. ACFN believes that a TRUMP should be required before the approval of any further large-scale industrial development in the oil sands region, including the Project, and that any subsequent regulatory process or regional planning decision should adhere to the threshold and limits identified in the TRUMP. The TRUMP should be the basis for taking treaty rights into account in regional planning, for project-specific assessment and for monitoring and follow-up.

Water and River Values

[1388] ACFN expressed concern that the Athabasca River and its tributaries are increasingly difficult to navigate. ACFN said that boats are used to procure fish and terrestrial resources adjacent to river banks and allow ACFN members to access areas without disturbance from industrial traffic. ACFN said that it is important for water levels in the Athabasca River to be high enough to allow navigation by heavily loaded small boats.

[1389] ACFN stated that it anticipates the Project will further increase the loss of access to, and use of, traditional lands by ACFN members because of low water levels in the Athabasca River downstream of the Project area and due to diversion of the Muskeg River. ACFN stated that the impact of the Project on water quantity would be an impediment on access to reserve and traditional lands.

[1390] ACFN stated that it participated in CEMA with the expectation that an in-stream flow need limit would be established for the Athabasca River and that it would protect ACFN's use of the river and its Aboriginal and treaty rights. ACFN said that because it does not believe that the proposed *Phase 2 – Lower Athabasca River Water Management Framework* for the Lower Athabasca River is protective of ACFN's use of the river and its rights, ACFN developed an ABF limit, which is the water level ACFN believes is necessary to allow navigation, access to traditional lands, and the exercise of Aboriginal and treaty rights by ACFN and other Aboriginal groups. ACFN stated that the ABF limit would require that at least 1.2 m (4 feet) of water be maintained in the river from fall to the end of the spawning season in the spring to allow for fish migration and navigation.

[1391] ACFN requested that the Panel recommend that Alberta and Canada adopt and implement the recommendations set out in ACFN's submission on the Phase 2 Water Management Framework, including the ABF limit. ACFN also recommended that any authorization issued pursuant to the *Water Act* should require that withdrawal cease when flows fall below the ABF limit.

[1392] ACFN also believes the increase in water withdrawals will contribute to the drying of the PAD. ACFN stated that it agrees the Bennett dam altered the water flow in the PAD but emphasized that the situation became noticeably worse with the expansion of the oil sands industry after 2003. ACFN also stated that a valid climate change assessment is required in order to fully understand the drying of the PAD.

[1393] Shell stated that it assessed project effects on the PAD in its updated May 2012 CEA for the application case and PDC. Shell concluded that cumulative effects of the Project, in conjunction with existing, approved, and planned developments, on water level changes and flooding in the PAD would be negligible based on its predicted minimal reduction of the Athabasca River's average depth.

[1394] ACFN was of the opinion that currently perceived levels of water contamination, in combination with other changes, are having serious psychosocial effects, resulting in widespread avoidance and loss of use by ACFN members in the region. ACFN stated that the Project was likely to result in increased loss of use, particularly downstream of the Project along the Muskeg and Athabasca Rivers, in documented areas of traditional use, and on ACFN's reserves. ACFN stated that it predicted this effect with a high degree of confidence.

[1395] In its *Athabasca River Use, Knowledge and Change Study*, ACFN documented 14 specific instances of lost use due to concerns regarding water quality downstream from the Firebag River. ACFN members reported changes in the following water quality indicators:

- changes in the taste and smell of Athabasca River water;
- presence of unusual foams or films on the water visible from boats or in cooking vessels;

- absence or decline of particular species, including insects, along the Athabasca River; and
- abnormalities in fish, moose, and other game, particularly in areas near the Muskeg River downstream of the Project, but also in other parts of the Athabasca River and PAD.

[1396] ACFN believed that muskeg is a living and breathing entity that is home to numerous species of animals and sustains the entire ecosystem. ACFN also believes that the Muskeg River is the life blood of the muskeg ecosystem, is sacred, and must be protected. ACFN said that in addition, the Muskeg River is used for navigation, to access trapping areas, and for other purposes.

[1397] ACFN noted that CEMA's Muskeg River Integrity Group was tasked with developing a watershed management plan for the Muskeg River basin but did not complete its work and at present only an interim watershed management plan is in place. ACFN also noted that despite the interim plan including an objective that there be no diversion of the mainstem of the Muskeg River, the interim plan does not include the Project and does not address Shell's proposed diversion of the upper Muskeg River. ACFN expressed concern that once again it appeared that bitumen ore was being given priority over protection of the Muskeg River basin. ACFN stated that diverting the river is not protecting it. ACFN requested that regulators provide full protection for the Muskeg River basin including the sterilization of the ore beneath it in order to sustain the spirit of the river.

[1398] ACFN reported that the Athabasca River and Kearl Lake areas both represent fishing sites used by ACFN members in the vicinity of the Project.

[1399] Shell stated that the information that it collected on traditional use indicated almost no subsistence fishing within the Project footprint. Shell stated that, in terms of direct project effects on fish and fisheries, the fish community within the direct Project footprint consists of relatively few fish species and the upper Muskeg River generally does not provide habitat for migratory species from the Athabasca River.

[1400] Shell noted in its 2012 draft NNLP that the EIA provided plans to conceptually integrate operational and closure drainage between the Project and other relevant approved oil sands mining operations in the Muskeg River watershed including KOSP. Shell stated that the main effects of the Project would be downstream of Kearl Lake such that concluding that the Project would have no direct effect on traditional fishing within the LSA.

[1401] ACFN expressed doubt about the efficacy of Shell's proposed compensation measures for fish and fish habitat. ACFN emphasized that fish in the compensation lake would not be available for human consumption for many years because of contamination by methyl mercury, resulting in the proposed compensation not being available to ACFN members for a long time. ACFN also stated that there was no evidence that ACFN members would find fishing in a compensation lake to be a culturally suitable alternative.

[1402] Shell acknowledged that habitat modelling of the Redclay Compensation Lake was based on a mature lake, which may not occur until 20 to 30 years after initial filling. Shell noted that one of the reasons for the proposed 2:1 compensation ratio was that it did not directly model the time lag until the lake matures and interim conditions while the lake is developing.

[1403] DFO explained that the compensation lake would not be available for traditional fishing as long as mercury levels were high. DFO stated that the time required for the mercury level to reach an acceptable level would vary depending on the mitigation measures, but confirmed that it could take as long as 20 or 30 years.

Terrestrial Resources

[1404] ACFN suggested that the Project will remove or affect habitat for many species that are traditionally relied upon, including woodland caribou, wood bison, and moose. ACFN noted that high-quality moose, woodland caribou, and migratory bird habitat within the Project LSA and rare wood bison habitat west of the Athabasca River will be directly disturbed. ACFN also stated that use of these species will be impacted by reduced access for ACFN members, increased industry and recreational access, and perceived increases in contamination of traditional resources or foods, leading to increased scope and intensity of avoidance or reduced use.

[1405] ACFN stated that the Project will also remove a known and regionally important wildlife corridor along the Muskeg River.

[1406] ACFN indicated its concerns about cumulative effects on moose, caribou, and wood bison in the RSA given their cultural importance. ACFN stated that large, contiguous areas are essential because of the wide-ranging and dispersed nature of wildlife resources in the boreal forest, especially large ungulates such as moose, bison, and caribou, upon which much of ACFN's cultural practice and traditional economy depends. ACFN's assessment of cumulative effects indicated that at the regional scale they will have high environmental consequences on traditional resources such as moose and furbearers.

[1407] ACFN indicated that historically important subsistence species such as woodland bison and woodland caribou are already at dangerously low levels and are scarcely available for traditional resource use throughout the region. It said that the regional landscape is changing in ways that may lead to the disappearance of wildlife species, including caribou, bison, and moose.

[1408] ACFN stated that since the 1990s, many ACFN members have lost use of large portions of land for the practice of rights, including subsistence rights, because of existing impacts such as restricted and gated access to areas controlled by oil sands companies, traffic, disturbance, and perceived contamination. The area affected includes important ACFN traplines; camps; cabins; trails; hunting, fishing, and resource procurement areas; and habitat areas used historically by bison, woodland caribou, and other species.

[1409] Consequently, ACFN considered the project effects on ACFN knowledge and use to be significant and adverse based on the ability of ACFN members to hunt or rely upon populations of wood bison and woodland caribou.

[1410] ACFN stated that caribou are a preferred, unique, and culturally important resource for ACFN knowledge, use, and practice and that ACFN has a spiritual connection and relationship with the caribou. ACFN also stated that it has a key role in protecting the caribou. ACFN disagreed with Shell's assertion that caribou were virtually absent in the LSA for the Project. ACFN said that reports from its members suggest that caribou still use the LSA. Caribou and their tracks have been seen throughout the LSA and Kearl Lake areas as recently as fall 2012.

ACFN members said that the caribou regularly use the muskeg habitat in the LSA to raise their young.

[1411] ACFN expressed concerns about effects on culturally important populations of woodland caribou within its RSA and adjacent to the Project LSA (such as the Kearl Lake area). ACFN said that within its RSA, areas of core woodland caribou habitat both north and east of the Project and areas downstream of the Project along the Muskeg and Athabasca Rivers would be at risk as a result of the application case.

[1412] ACFN stated that the wood bison are an important traditional resource for ACFN and that ACFN relies on the Ronald Lake herd to exercise its traditional rights because it is the only herd of wood bison available to ACFN hunters outside of Wood Buffalo National Park. ACFN was concerned that construction of the Redclay Compensation Lake will have negative effects on the Ronald Lake herd, potentially contributing to the demise of this herd. ACFN stated that bison are currently hunted by ACFN members and are considered an important component of planned future ACFN use.

[1413] ACFN noted that wood bison were listed as threatened under *SARA* in 2000, but that Canada still hasn't produced a recovery strategy. ACFN said its understanding from EC was that a recovery strategy was to have been in place by the end of 2011.

[1414] EC stated that development of the recovery strategy had been delayed by discussions about disease within the herds and the implications this had for the recovery strategy. EC said that completion of the recovery strategy is now targeted for the end of 2013, following consultation with stakeholders.

[1415] Shell stated that the wood bison population in the RSA is limited by disease and not by the availability of habitat. As a result, Shell said that there will be a negligible decline in wood bison abundance in the RSA from the PIC to base case, application case, and PDC. ACFN's expert, Dr. Komers, agreed with Shell's assertion that bison are not habitat limited in the RSA.

[1416] ACFN stated that moose are a culturally important species that provides an important source of protein for the community.

[1417] ACFN disagreed with the results of Shell's PVA for moose (see the Effects on Wildlife and Their Habitat section) and believed that Shell had not considered ACFN's TEK, given the contradictions in their respective conclusions. ACFN said that trappers and First Nations people consistently report declining moose numbers in the region, whereas Shell's analysis predicted some growth in moose populations. ACFN further said that Shell's PVA conflicts with modelling conducted in the development of the *TEMF*, which concluded that moose populations are already below their natural range of variation and will continue to decline.

[1418] ACFN indicated that between 1992 and 2008, an average of 42 km^2 of moose habitat has been removed each year from ACFN's RSA and moose density has declined substantially. ACFN members report that moose and deer are increasingly avoiding the Kearl Lake area.

[1419] ACFN concluded that destruction of habitat by the Project is likely to act in concert with increased access by non-ACFN hunters to reduce the ability of ACFN members to hunt or rely on moose for food. ACFN also concluded that these effects are likely to result in a discernible change to the preferred exercise of a culturally important practice, land use, or right and this will elicit strong concern from ACFN members. ACFN members also reported that the noise from cannons used in bird deterrent systems interferes with hunting moose and other animals.

[1420] ACFN was concerned about the health and taste of moose. ACFN said that many of its members will avoid the use of moose if there is a perceivable behavioural or physical abnormality (cysts or animals that look sick). It said that its members are currently cautious regarding the hunting of moose and collection of other animals in the Firebag area in the RSA because of fear of contamination.

[1421] ACFN indicated that migratory birds, especially spring waterfowl, were important in the past and are currently highly valued and an essential component of planned future ACFN use. ACFN further described that bird hunts are important focal periods for community and family on the land, given that many ACFN families would congregate in large camps for the duration of the hunt. As such, the seasonal bird hunt gatherings have great importance socially and culturally for ACFN and support the sharing of knowledge and food among community members and between generations. ACFN said that the Kearl Lake area is an important area for hunting waterfowl.

[1422] ACFN said that both waterfowl and muskrat serve as indicators for the health of the PAD and the Athabasca River. ACFN described how muskrat were culturally important for providing clothing and food for its members. ACFN described a large-scale decrease in the number of muskrat in recent history, which it attributed to oil sands development.

[1423] ACFN said that the decline in migratory bird abundance and changes in migratory routes are affecting the spring hunt in the oil sands region and specifically in the PAD.

[1424] ACFN said that intentional disturbance of birds and flyways through use of deterrent cannons on tailings ponds may further adversely impact the current or potential availability of migratory birds for ACFN use in the RSA.

[1425] ACFN believed that the following factors could all contribute to the change of migratory routes of birds:

- large areas along the Athabasca River that are cleared of vegetation;
- large plumes of dust, bad-smelling smoke, and pollution in the air;
- large amounts of reflective metal and numerous large, noisy, brightly coloured vehicles constantly moving; and
- near constant noise that increases due to cannons and bird deterrent systems as birds fly overhead.

[1426] EC confirmed that the migratory routes of birds have changed which could impact the availability of these birds in the PAD. According to EC, the reasons for the changes in migratory routes and associated decline of migratory birds in the PAD are not clear and the oil sands industry may or may not be contributing to the observed changes.

[1427] ACFN expressed concern that Shell did not appear to have incorporated into its assessment the TEK related to migratory birds that ACFN had provided in 2008.

[1428] Shell indicated that ACFN participants at a CEMA-sponsored workshop in 2005 provided some TEK describing the decline of migratory birds and muskrat in the PAD. Shell stated that its assessment of baseline conditions indicated no decline in the number of migratory birds or muskrat in the PAD. Shell acknowledged that it did not know how to incorporate the additional TEK ACFN provided because it was not consistent with the other baseline data that Shell had collected.

Social, Economic, and Cultural Effects

[1429] ACFN was critical of Shell's approach to the assessment of social, economic, and cultural effects on ACFN. ACFN stated that Shell's socioeconomic assessment focused narrowly on mainstream economic issues and did not appropriately consider the unique interests, values, and culture of ACFN. Similarly, ACFN was of the view that Shell's cultural assessment suffered from several methodological shortcomings and did not provide a proper assessment of the impacts of the Project, or oil sands development more generally on ACFN culture.

[1430] ACFN submitted several detailed reports that identify and describe potential social, economic, and cultural effects of the Project and development more generally on ACFN. *A Narrative of Encroachment Experienced by the Athabasca Chipewyan First Nation* (*Larcombe Report*) provides a summary of historic and current drivers of encroachment within ACFN's traditional territory and a comprehensive discussion of the resulting effects of encroachment on ACFN rights, values, and knowledge. *Athabasca Chipewyan First Nation Supplemental Social, Economic and Cultural Effects Submission for Shell Canada's Proposed Jackpine Mine Expansion* provides information about social, economic, and cultural changes experienced by ACFN members over time and those anticipated in the future, with an emphasis on impacts from the oil sands sector and Shell's Project and PRM. ACFN acknowledged that Shell had provided funding to support the completion of this report.

[1431] Cultural and social priorities identified by ACFN members reflect a desire for the continued ability to

- practise a traditional way of life;
- maintain a healthy environment;
- keep and strengthen family ties;
- keep and strengthen community services and relations;
- sustain physical, mental, emotional, and spiritual health; and
- encourage economic sustainability.

[1432] ACFN also identified the following valued cultural components:

- meaningful access to preferred traditional lands for traditional cultural pursuits;

- maintenance of traditional values, skills, and language through intergenerational knowledge transfer;
- maximizing time on the land for all generations;
- access to clean air, water, wildlife, and vegetation;
- adequate privacy to gain solace from quiet enjoyment of the land; and
- respect, sharing/reciprocity, and balance in relations with other culture groups.

[1433] ACFN explained that its traditional way is a spiritual one and that it is important to the Dene people to be connected to the land. ACFN indicated that when one is connected to the land, the land takes care of its peoples' physical and spiritual needs. ACFN stated that the land must be preserved so that people can spend time out on it, and maintain their culture and way of life. ACFN described cultural identity as a sense of knowing who you are and where you come from and stated that it requires keeping the culture alive. ACFN said that the harvesting, consumption, and sharing of country foods has deep cultural meaning for Aboriginal peoples and is a primary means for transmitting cultural values, skills, and spirituality. Passing on knowledge and stories through time spent together in families, in culture camps, and in gatherings and encouraging strong interaction between Elders and youth are other important ways that social cohesion and culture are maintained.

[1434] ACFN described how, over the past 120 years, government and industry activity has progressively and cumulatively encroached on the landscapes and waterscapes that have supported ACFN's way of life and livelihood. Contemporary drivers of encroachment identified in the *Larcombe Report* include population growth, hydroelectric development (including development of the Bennett Dam), quarry and other mineral exploration and development, timber harvesting and processing, oil sands development, linear disturbances, urban development, recreational and sport use of the land and resources, public land designations and plans, and government allocation of water resources.

[1435] ACFN stated that the development of the oil sands industry has cumulatively limited the amount, quality, and distribution of land available for the meaningful practice of its treaty rights and maintenance of its culture. ACFN explained that barriers such as gates and fences, irritants such as noise pollution and increased traffic, physical disruptions such as infrastructure and roads, and concerns about the quality of resources are all impediments to ACFN's land use and thus are impediments to the transmission of ACFN culture. ACFN stated that damage to its traditional lands from the oil sands industry limits elders' ability to teach skills that would allow the next generations to live on the land as their predecessors did. ACFN stated that the lack of transmission of skills affects the younger generation's willingness to adopt a traditional way of life, including practical skills, spiritual and ceremonial practices, and cultural values.

[1436] The primary economic impacts of encroachment identified in the *Larcombe Report* include a decline in harvest success and opportunity and increased harvesting cost. ACFN stated that 78 per cent of the community still harvest off the land and consume traditional resources on a daily basis to provide for their families. ACFN said that the contribution of harvested goods to individual family and community economic welfare can be significant.

[1437] ACFN believed that the social, economic, and cultural effects of the Project will be strongly adverse for ACFN members living on the land, but acknowledged that there will be both adverse and positive effects for those living in Fort Chipewyan and Fort McMurray. ACFN identified improvements to infrastructure and opportunities for employment, education, and training as having been beneficial consequences of past developments, while outmigration from the community, social dysfunction, and economic and impact inequities as having been negative consequences.

[1438] ACFN identified a study that reported the country food consumption in Fort Chipewyan (not limited to ACFN members) averaged 0.5 kg per person per week, with some families reporting consumption of 1.25 kg per person per week of country food. ACFN explained that the contribution of country food to the ACFN economy is important given the higher cost of food in Fort Chipewyan and Fort McMurray. ACFN explained that elders, single parents, and people on fixed incomes have no choice but to reside on and live off the land.

[1439] In order to provide a perspective on the economic value of country food to ACFN members, ACFN provided rough calculations using the replacement cost method which involves multiplying a retail price by reported average edible food weights for various species. ACFN provided the following values for the country foods it typically harvests: moose $5792, barren land caribou $1448, bison $8689, beaver $257, goose $51 and walleye $16. ACFN stated that a modest harvest for a family could represent more than $13 000 of high-quality food for the year, adding 61 per cent to the 2010 median after tax family income. ACFN stated that the contribution of country food to lower income members such as elders or single mothers is even greater.

[1440] ACFN explained that access difficulties, general disturbance, increased competition for resources, having to go farther afield to attain harvest success or seek resources deemed safe to eat, the need to haul potable water, and other issues all add hours of time to harvesting activities and increase the cost of TLU. ACFN said that as the amount of time required for the harvesting of traditional food increases, it becomes more difficult for members with a regular job to gather traditional resources from the land.

[1441] According to ACFN, the psychosocial impacts of cultural loss due to changes to the land and reduced emphasis on the harvesting, consumption, and sharing of country foods can result in several sociocultural changes, including

- a loss of traditional knowledge and skills, including the intergenerational transfer of traditional knowledge and skills;
- a general sense of alienation from traditional lands and loss of continuity and connection to place;
- a loss of sharing norms;
- a loss of hope for the sustenance of traditional culture over time and a decline in cultural identity and self-esteem; and
- a decline in family, extended family, and community social organization.

[1442] ACFN stated that cultural knowledge transmission occurs while on the land, where children learn about such matters as cultural stories, legends, place names, and protocols of respect for nonhumans. According to ACFN, the loss of intimate contact with the land is identified by several authors as the primary reason for the degradation of traditional systems.

[1443] ACFN explained that it considered the removal of lands from Aboriginal use for periods of time longer than one generation permanent for the purposes of traditional use and culture. ACFN stated that the interruption of knowledge transmission regarding the disturbed areas would have irreversible effects on tangible and intangible elements of culture and TLU. ACFN said that by losing the use of a region, such as the Project area, impacts are expected on particular forms of knowledge such as place names, histories, and the cultural practices that take place in the area.

[1444] ACFN also expressed concern that due to direct disturbance by the Project, the holder of RFMA 1714 and the other Aboriginal land users will have to practise their land use farther away. ACFN stated that the land users currently relying on the Project area would likely have to use an area that they are not familiar with and at a higher cost.

[1445] ACFN stated that continual fluctuations in population numbers are having negative effects on the ability of community planners to anticipate needs and provide adequate housing for residents of Fort Chipewyan and Fort McMurray and that these are further impeded by restricted availability of land, materials, and labour for building.

[1446] ACFN reported that the number of Aboriginal workers in oil sands jobs has increased steadily since the late 1990s, but the percentage of Aboriginals in the oil sands workforce remains at 10 per cent or less. ACFN reported that large differences in salary and employment rates exist between men and women in the Aboriginal workforce and that Aboriginal workers report cases of racism in hiring and layoff practices, as well as on the job. ACFN stated that its members face obstacles securing long-lasting employment in oil sands operations, particularly because of a lack of education, training, skills, or a driver's licence; inability to pass drug and alcohol testing; and lack of opportunity for advancement to positions considered meaningful by ACFN members, resulting in high turnover rates. ACFN acknowledged, however, that companies operating in the oil sands have supported training initiatives and funded educational programs for ACFN members.

[1447] ACFN stated that increased out-migration of ACFN members to Fort McMurray and the associated increase in reliance on the wage economy and exposure to western industrial values were further contributing to an erosion of ACFN culture. ACFN said that members who left the community have less exposure to land-based culture and cultural programming and fewer opportunities to access the cultural benefits of ACFN culture, such as the sense of well-being from being out on the land. ACFN stated that because of their loss of connection to the community, these individuals would be less likely to practise or adhere to Dene cultural values.

[1448] ACFN stated that the potential for an increased draw of ACFN members back into the community due to Fort Chipewyan being a point of hire and fly-in/fly-out location for the Project was seen as a benefit of the Project. Drawbacks of the fly-in/fly-out programs identified by ACFN include the length and stress of rotation schedules and the social and family dysfunction that may result from long absences of the working family members.

[1449] ACFN expressed concern that the effects of the Project on human health lack detail and that individual and community health concerns have not been addressed in a realistic and comprehensive manner. ACFN also believed that the indirect impacts from this project combined with other industrial activities in the region on individual and community health remain unaddressed. ACFN was of the view that given that potential mitigation measures to address these impacts have not been developed, the magnitude of residual effects and the effectiveness of mitigation cannot be determined. ACFN also said it is unclear who will be responsible for monitoring and assessing health risks to ACFN communities.

[1450] The *Larcombe Report* states that there is virtually unanimous agreement within the medical field that country foods contribute to good health because these foods are nutritionally dense, travelling and securing country foods generally requires significant physical exertion, and those with less access to country foods and limited disposable income are often faced with having to purchase cheaper and less healthy alternatives. The report notes that a shift away from country foods and the associated change in dietary nutrition is often cited as the basis for the declining health status of Aboriginal peoples.

[1451] The *Larcombe Report* also identified decreased food security and the associated psychological stress as an important effect. Declining opportunities to access traditional foods, increased costs, and concerns about contamination of country foods may all contribute to psychological stress related to the availability and safety of food sources.

[1452] ACFN stated that the influx of nonaboriginal oil sands workers into the region affects the availability of health and social services through increased demand (particularly by those who suffer mental health and dysfunction issues related to work conditions), reduced availability of service providers, and increased pressure on transportation and accommodation required by those seeking services not available in their home community. These impact pathways contribute to the rising communal and individual anxiety in Fort Chipewyan and may be causing adverse mental and physical health outcomes.

[1453] ACFN cited temporary displacement and permanent out-migration to access education, training, and jobs; increased exposure to social dysfunction risks, particularly drugs and alcohol; and reduced connection to culture, extended family, and core values as negative social consequences of oil sands developments.

[1454] Less access to traditional livelihoods has resulted in an increased reliance on education and an increased desire for higher quality and more diverse (nonoil sands related) options in the community. The sense that the oil industry is the only employment option in the community has led some ACFN members to feel mental stress; experience social and cultural conflicts in the workplace; feel that their options for meaningful work are limited; feel powerless to control their futures; and experience a dissociation from traditional culture. The latter are cited as factors contributing to youth suicide rates. Costs and logistics associated with seeking employment and education outside Fort Chipewyan are prohibitive to many ACFN members and have the potential to disrupt community and family dynamics.

[1455] ACFN believed that encroachment has and continues to directly and indirectly affect the ability of ACFN members to pursue and enjoy the rights associated with the use of the landscape and waterscape for cultural, social, economic, and health benefits. The *Larcombe Report* acknowledged however, that there is currently insufficient information to make a definitive statement as to whether ACFN's ability to pursue or enjoy these rights is at or beyond the thresholds necessary for sustainability. ACFN believed that the project-by-project environmental assessment and regulatory review process does not permit a comprehensive assessment of impacts resulting from existing, proposed, and planned development on ACFN rights, values, and knowledge. ACFN believed that an effects or mitigation monitoring program focused specifically on traditional use and knowledge would contribute to a better understanding of the situation and more proactive decision-making.

[1456] ACFN concluded, based on its analysis, that while the Project has the potential to have a marginally beneficial impact on ACFN economic conditions, there is increasing evidence that ACFN members do not feel the tradeoffs on the environment, human health, ACFN way of life, well-being, and quality of life that are required for them to benefit from an incremental increase in wage economic activity from new oil sands development are acceptable or worth the risk.

Analysis and Findings

Rights Being Asserted

The Agreement requires the Panel to consider the effects of the Project on asserted or established Aboriginal and treaty rights, to the extent the Panel receives such information. The Panel has not made any determinations as to the validity of the Aboriginal or treaty rights being asserted by ACFN or the strength of such claims but for the purposes of assessing the potential effects of the Project on ACFN's Aboriginal and treaty rights, the Panel accepts that ACFN has the rights being asserted.

Consultation

[1457] The Panel notes the concerns raised by ACFN related to Shell's consultation activities.

[1458] The Panel understands that ACFN has unresolved concerns about the Project and that ACFN and Shell were not able to come to agreement on one aspect of the measures necessary to mitigate the effects of the Project. The Panel also understands that ACFN and Shell continue to have differences of opinion regarding several issues, including the methodology Shell used to assess the impacts of the Project on ACFN TLU, rights, and culture, the significance of Project and cumulative effects, and the diversion of the Muskeg River.

[1459] The Panel believes that it is possible for effective engagement and consultation to occur without the parties coming to agreement on all matters. The Panel understands that it may be very difficult or even impossible for agreement to be reached on some issues given the divergent and competing interests and objectives of the parties.

[1460] The Panel notes that Shell and ACFN have a long history of consultation and working together. Although the relationship appears to have become somewhat more adversarial recently and the parties were unable to reach a mitigation agreement for the Project, the evidence submitted by both Shell and ACFN indicates that extensive interaction and consultation has occurred concerning the Project since at least 2007. Shell provided numerous opportunities for ACFN to learn about and provide comments on the design and assessment of the Project and provided significant capacity funding to allow ACFN to complete project-specific technical reviews and traditional use studies as well as to support the day-to-day operation of the ACFN IRC.

[1461] The Panel notes that although Shell completed its cultural assessment without the direct involvement of ACFN, Shell also provided funding to allow ACFN to complete its own cultural assessment, which ACFN submitted to the Panel.

[1462] The Panel believes that Shell invested considerable time, effort, and resources in order to understand and, where possible, address ACFN concerns related to the Project. The Panel finds that Shell's efforts were reasonable and appropriate.

[1463] The Panel acknowledges ACFN's frustration with what it perceives as an unwillingness by Alberta and Canada to meaningfully consult and work with ACFN to address its concerns about the Project, the taking up of lands within its traditional territory, and the assessment and management of cumulative effects that it believes are impacting ACFN TLU, rights, and culture.

[1464] The Panel notes that Canada pointed to the correspondence between ACFN and federal government departments, as well as its own submissions, as evidence that Canada had and continues to consult with ACFN.

[1465] The Panel stated at the outset of the hearing that it would not rule on the adequacy of Crown consultation as it did not have the jurisdiction to do so, and even if it did have the jurisdiction, it would be premature to do so as there would be further opportunities for consultation before Crown decisions are made or authorizations issued for the Project.

[1466] The Panel notes that both Alberta and Canada stated in the NQCL process that the consultation process was not yet complete and that there would be additional opportunities for consultation after the Panel's report had been completed and before Crown decisions or regulatory authorizations were issued for the Project. The Panel has therefore included a recommendation that before other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with each of the Aboriginal groups in light of the issues identified in this report to determine whether additional consultation is necessary to address these issues.

[1467] With respect to ACFN's request that the Panel recommend that an independent commission of experts be established to evaluate consultation and accommodation of impacts in the oil sands region, the Panel declines to make this recommendation as it does not believe this recommendation falls within its jurisdiction or mandate.

Effects on Traditional Land Use, Rights, and Culture

EIA Methodology

[1468] The Panel notes ACFN's concerns about the methodology Shell used to assess the effects of the Project on ACFN TLU, rights, and culture. The Panel shares some of those concerns, as outlined in the Shell's Assessment of Impacts to Aboriginal Traditional Land Use, Rights, and Culture section.

[1469] In light of the methodological concerns identified, the Panel found that it was unable to rely on the significance determinations provided by Shell for Project effects and cumulative effects on environmental resources and the associated effects on Aboriginal TLU, rights, and culture. The Panel, therefore, completed its own assessment of significance based on the information provided by Shell and the documents and evidence provided by the Aboriginal groups, including ACFN.

Traditional Land Use

[1470] The Panel notes that the land within or near the Project LSA is already disturbed by other industrial projects and evidence has shown that avoidance of use is already occurring due to access restrictions, loss of enjoyment due to noise and odours, and fear of contamination. The Panel notes that despite the loss of use that is already occurring, ACFN provided evidence of historic and ongoing TLU in the Project area and that some of the impacted values are unique.

[1471] The Panel understands that some trapline areas will be affected by the Project and that RFMA 1714, of particular importance to ACFN, will be affected to a significant degree. The Panel also understands that the Project area is a shared land and that more persons than just the trapline holder and his/her family practise their land use within or close to the Project footprint. The Panel notes that Shell plans to compensate the trapline holders for their loss but agrees with ACFN and the other Aboriginal groups that this compensation is for the loss of commercial trapping rights and does not provide mitigation for Project effects on other Aboriginal uses or users of the land.

[1472] The Panel has determined that the Project will likely result in significant adverse effects at the LSA level on several terrestrial resources of importance to ACFN including wetlands, traditional plant potential, biodiversity, and wetland-dependant migratory birds and species at risk.

[1473] The Panel notes that Project effects will be long term as reclamation and return of the land for traditional use will not occur for many years. The Panel also believes that the other mitigation measures proposed by Shell do not provide adequate mitigation for the loss of traditional use in the interim. The Panel, therefore, finds that the Project will result in a long-term loss of TLU opportunities for ACFN members. However, while the Panel believes that the Project will adversely affect the TLU activities of some ACFN members in the Project area, the Panel does not believe that Project effects will destroy or fundamentally alter the ability of ACFN members to practise TLU activities or exercise their Aboriginal or treaty rights. The Panel believes that there are still areas within the homeland and proximate zones identified by ACFN where its members may practice TLU activities and exercise their Aboriginal and treaty rights. While the Panel acknowledges that some of those areas are also subject to development pressures and that there are practical limits to how far individuals may be able or willing to travel to access the resources necessary for these activities, the Panel concludes that the Project effects on ACFN's TLU and Aboriginal treaty rights are adverse, but not significant.

[1474] The Panel has also determined based on the evidence that the Project, in combination with other existing, approved, and planned developments, is likely to result in significant adverse cumulative effects on several environmental resources of interest to ACFN in the broader region surrounding the Project, including wetlands, old-growth forests, traditional plant potential, biodiversity, and wetland- and old-growth-dependant migratory birds and species at risk, including caribou.

[1475] Shell's updated CEA concluded that the total amount of disturbance for the application case and PDC amounted to 11 per cent and 13 per cent of ACFN's total traditional territory, respectively. The Panel notes, however, that if only the portion of ACFN's traditional territory that occurs within the RSA is considered, the amount of disturbance increases significantly to 35 per cent and 41 per cent of the territory for the application case and PDC, respectively.

[1476] The Panel is of the opinion that ACFN has provided evidence of existing cumulative effects on its TLU activities leading to loss and avoidance of use and that traditional users are finding it increasingly difficult to relocate and find lands of equivalent value. The Panel, therefore, finds that the Project effects, in combination with the effects of other existing, approved, and planned projects, are likely to have a significant adverse effect on ACFN's TLU and Aboriginal and treaty rights in the broader region surrounding the Project.

[1477] The Panel agrees with ACFN that assessing the effects of individual projects on the TLU and Aboriginal and treaty rights of ACFN and the other Aboriginal groups is not efficient or effective and that *LARP* does not specifically address the issues of Aboriginal TLU or rights. The Panel has therefore included a recommendation that Alberta develop, in collaboration with Canada, the Aboriginal groups, and other stakeholders, a TLU management framework as part of the *LARP*.

[1478] The Panel acknowledges and understands the traditional and cultural importance of caribou, wood bison, and moose to ACFN. The Panel notes that the clearing of the land for the Project will reduce habitat availability for all three species and result in increased difficulties accessing the species by ACFN members. Although the Panel has determined that Project and cumulative effects to wood bison and moose were adverse, but not likely to be significant (see the Effects on Wildlife and Their Habitat section), the Panel has included several recommendations to Canada and Alberta regarding the management of these species. The Panel has also included recommendations to the Governments of Canada and Alberta concerning the management of caribou.

Navigation

[1479] The Panel notes ACFN's concerns about low water levels in the Athabasca River and the PAD and the impact these low levels have on navigation, TLU, and the exercise of Aboriginal and treaty rights. The Panel acknowledges that changes in navigation may be occurring but believes the reasons for the observed changes are not clearly understood and are likely the result of a combination of factors, including the discontinuation of dredging, the construction and operation of the Bennett dam, variation in water flows due to natural wet-dry cycles or climate change, and water withdrawals by oil sands operations and other upstream water users.

[1480] The Panel also notes ACFN's concerns about the delay in finalizing the *Phase 2 – Lower Athabasca River Water Management Framework* and that the absence of a commitment to a level which ensures protection of Aboriginal use (ABF) in the draft Phase 2 Framework. The Panel recognizes that federal and provincial agencies have already established what they consider to be acceptable low-flow restrictions within the Framework based in part on consultation with Aboriginal stakeholders. The Panel also understands that the *Water*

Management Framework for the Lower Athabasca River Phase 1 contains safeguards for seasonal low-flow periods to prevent major water withdrawals during high-risk times of the year.

[1481] Based on Shell's commitment to comply with existing flow allocation restrictions outlined in the current *Water Management Framework for the Lower Athabasca River Phase 1* and with future Phase 2 conditions, and the negligible effects from Project related water withdrawals on regional water flows, the Panel concluded that the Project was unlikely to result in significant adverse Project or cumulative effects to water levels or navigation in the Athabasca River or PAD. The Panel, therefore, also concluded that the Project is unlikely to result in adverse cumulative effects to Aboriginal traditional use or Aboriginal or treaty rights.

[1482] Notwithstanding that the Panel determined that the Project was unlikely to result in any significant adverse effects to water levels or navigation in the Athabasca River or PAD, the Panel has included several recommendations to the Governments of Canada and Alberta that address concerns raised by ACFN about water levels and navigation on the Athabasca River (see the Shell's Assessment of Effects on Aboriginal Traditional Use, Rights, and Culture section)

Diversion of the Muskeg River

[1483] The Panel notes that ACFN has significant unresolved concerns related to Shell's plans to divert the upper portion of the mainstem of the Muskeg River, including its effect on the spirit of the river. The Panel found that the diversion of the Muskeg River was in the public interest having regard for the large amount of bitumen resource that would be sterilized if the river is not diverted, the low fisheries habitat and resource potential of the segment to be diverted, the negligible to low effects to downstream water quantity and quality predicted, and limited evidence of current traditional use along this stretch of the river. The Panel also had regard for TC's conclusion that the effects of the diversion of the Muskeg River on navigation could be mitigated.

[1484] The Panel notes that both Fort McKay and the MCFN found Shell's proposed MRDA satisfied their concerns about the diversion of the river. However in light of ACFN's unresolved concerns, the Panel recommends that the Governments of Alberta and Canada consider ACFN's unresolved concerns about the diversion of the Muskeg River and the need for additional consultation, mitigation, or accommodation before other provincial and federal approvals are issued.

Fishing

[1485] The Panel notes Shell's assertion that there is little evidence of traditional fishing by ACFN in the upper reaches of the Muskeg River appears to be supported by the limited evidence provided by ACFN regarding this use. Given the limited evidence of fishing in the areas of the Muskeg River to be diverted, Shell's proposed measures to protect downstream fisheries and Shell's plans to compensate for Project effects to fish and fish habitat through construction of the Redclay Compensation Lake, the Panel found that the Project is unlikely to result in significant adverse Project or cumulative effects on fish or fish habitat. The Panel, therefore, also concluded that the Project will not have significant adverse effects on Aboriginal fishing.

Water Quality

[1486] The Panel notes ACFN's concerns related to water quality in the region. Based on the modelling and mitigation proposed by Shell, the Panel concluded that the Project will not result in significant adverse effects to water quality in the Athabasca River, downstream reaches of the Muskeg River, or PAD. The Panel therefore also concluded that the Project would not likely result in significant adverse effects to TLU or aboriginal or treaty rights as a result of water quality issues.

[1487] The Panel acknowledges that ACFN and the other Aboriginal groups raised concerns about the quality of data and assumptions used in Shell's water quantity and quality models and that the modelling is only as reliable as the data and assumptions used to generate and populate the models. Although models will always be subject to some uncertainty, the Panel believes that when fully implemented, the surface water quality management framework under *LARP* and the new *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* are appropriate mechanisms to confirm the accuracy of assessment model predictions and to identify any adverse cumulative effects to water quality.

Social, Economic, and Cultural Effects

[1488] The Panel notes ACFN's concerns about the methodology employed by Shell in its CEA. The Panel has similar concerns as summarized in the Shell's Assessment of Effects on Aboriginal Traditional Land Use, Rights, and Culture section.

[1489] The Panel found Shell's cultural assessment of limited value in understanding the effects of the Project on ACFN culture because Shell's assessment was done at a very high level and did not provide an assessment of the potential cultural effects of the Project on each First Nation or Aboriginal group as requested by the Panel. Shell's cultural assessment also relied heavily on Shell's determination of the significance of Project effects to the resources of importance to Aboriginal people, some of which the Panel did not agree with.

[1490] The Panel found the information provided by ACFN with respect to the effects of encroachment on its rights and interests and the social, economic, and cultural effects of the Project and PRM on ACFN to be very helpful in developing the Panel's understanding of the effects of the Project as well as development more generally, on ACFN culture. The Panel finds that ACFN provided extensive evidence of impacts to its TLU and explained how these impacts to its TLU result in impacts to ACFN culture.

[1491] Based on the evidence provided by Shell and ACFN, the Panel believes that oil sands activity and other development and activities within the RMWB have already contributed to significant socioeconomic and cultural change for ACFN. Some of the effects, such as increased employment and income levels, have been positive while others, such as loss of opportunities for TLU activities and migration out of the community, have been negative. The Panel finds that the cumulative effects on some elements of ACFN's culture are already adverse, long-term, likely irreversible, and significant and that these effects are likely to increase in the future if the projects identified in the application case and PDC proceed as planned.

[1492] The Panel is of the opinion that people's cultures are naturally evolving and that the adverse aspects of the cultural changes can be mitigated when people have control over the changes experienced in their daily life. The Panel, therefore, recommends that the Government of Alberta, in conjunction with the Government of Canada, provide greater opportunities for involvement of ACFN and the other Aboriginal groups in regional planning and in the stewardship of the traditional resources, in order to mitigate the adverse effects on the TLU and culture of ACFN.

[1493] The Panel acknowledges ACFN's concerns about the potential impacts of oil sands development on the health of ACFN members living in Fort Chipewyan and elsewhere in the oil sands region. Although the Panel concluded that the Project was not likely to result in significant adverse Project or cumulative effects to human health, the Panel has included a recommendation that Alberta Health and Wellness and HC complete a regional baseline health study focused on First Nations, Métis, and other Aboriginal groups that considers all relevant health factors, including environmental exposures and potential exposure pathways such as water, air, and consumption of traditional foods (see the Human Health section). The Panel notes that the Joint Review Panel approving Phase 1 (*EUB Decision 2004-009*) made a similar recommendation.

Métis Nation of Alberta

Evidence

Participation and Requested Disposition

[1494] MNA stated that it represents Métis members in the region from Lac La Biche to Fort Chipewyan, Alberta, including Métis Locals 1935 (Fort McMurray) and 125 (Fort Chipewyan) and several Métis individuals. MNA did not represent FMMCA (Métis Local 63).

[1495] MNA stated that Shell's EIA was lacking in information about Métis traditional use. It was concerned about impacts on Métis use of lands and resources and socioeconomic impacts. MNA requested that the Panel deny Shell's application on the basis that the application did not address the impact on the Aboriginal rights of the Métis people of the area.

[1496] MNA made several recommendations to the Panel. Appendix 8 provides a summary of key MNA recommendations.

Rights Being Asserted

[1497] MNA stated that its members have historically used a broad traditional territory located along both sides of the Athabasca River and that there are many contemporary Métis communities in northern Alberta, including Fort McMurray, Fort McKay, Fort Chipewyan, Conklin, Willow Lake, and Chard. MNA stated that its members continue to hunt, trap, and conduct other traditional activities in this area, including in the Project area.

[1498] MNA stated that section 35 of the *Constitution Act*, 1982, includes Métis people and confirms that the Métis have Aboriginal rights. MNA stated that it also relies on the Supreme Court of Canada's *Powley* decision, the first affirmation of Métis rights in accordance with section 35. According to MNA, *Powley* defined several important ideals:

- It confirmed that Métis are a full-fledged rights-bearing people.
- It set out a test for the recognition of Métis communities and their food harvesting rights.

- It affirmed that Métis harvesting rights can coexist with treaty or Aboriginal rights of First Nations.

[1499] MNA also asserted that Alberta's *Métis Harvesting in Alberta* (June 2007 with updates) affirms Métis harvesting rights for some Métis in some areas of Alberta, including the Project area and the broader region between Lac La Biche and Fort Chipewyan.

[1500] Shell questioned the relevance of the *Powley* decision to the current proceeding. Shell argued that *Powley* pertains to how rights are determined and that while Shell is interested in determining the effects of the Project on Aboriginal rights, it does not attempt to establish whether the rights exist. Shell stated that for the purposes of consultation, Shell assumed that the Métis have the rights they assert.

Adequacy of Consultation by Shell

[1501] Shell stated that it has consulted with Fort McMurray Métis Local 1935 and Fort Chipewyan Métis Local 125 since 2007 in the same manner as consultation with other potentially affected Aboriginal groups and that Shell has established good neighbour agreements with these locals. Shell stated that it had attempted consultation with Chard Métis Local 214 and Willow Lake Métis Local 780 but had not received a response.

[1502] Shell stated that it completed its consultation plan, which AENV approved, according to Alberta's *First Nations Consultation Policy*. Shell said that it had consulted with the Métis, notwithstanding that the policy provides no direction or guidance with respect to Métis consultation.

[1503] MNA asked Shell what impact AENV's rejection of Fort McMurray Local 1935's and the Wood Buffalo Local Métis Corporation's statements of concern had on Shell's approach to consultation with the Métis Locals. Shell said that it did not change Shell's approach or commitment to engaging with the Métis Locals. Shell stated that it had a long relationship and had been consulting with Métis Locals 125, 1935, and 63 and reiterated that it had good neighbour agreements with each of these groups.

[1504] MNA stated that Shell's consultation with the Métis locals was not meaningful. MNA said that meetings were focused on providing information rather than consultation. MNA indicated that Shell did not adapt the content of the meetings and presentations for the audience and had failed to consult with some key Métis individuals, including a Métis trapline holder. MNA interpreted Shell's inability to recall any specific concerns of the Métis locals about the Project when asked at the hearing as a reflection of Shell's general lack of understanding of Métis issues and concerns.

[1505] Shell stated that it was surprised by MNA's characterization of its consultation with Métis Locals 125 and 1935 as not meaningful. Shell submitted that it held dozens of meetings with these locals as indicated in the consultation logs. Shell said that it received positive feedback from the participants in the December 2008 meeting with Local 1935 that MNA characterized as not meaningful. Shell said that the Métis trapper MNA referred to had attended this meeting and that resulted in a direct dialogue between the trapper and Shell. Shell said that it had discussed how best to incorporate the traditional use information from Métis Local 1935 and provided a detailed written response to Local 1935 following the meeting. Shell said that it held another open house and workshop with Métis elders in May 2009 and similar open houses with Local 125 in April 2009.

[1506] Métis Local 125 stated that it was concerned that although Fort Chipewyan is a Métis town and its members live in the same community and would experience the same impacts from the Project as ACFN and MCFN members, Shell did not treat them the same as their First Nations' neighbours. Métis Local 125 did acknowledge however, that its relationship with Shell has generally been good.

[1507] MNA was concerned that Shell had not provided capacity funding to MNA or the Métis locals it represented to allow them to complete project-specific TLU or technical reviews, which limited its ability to participate effectively in the review of the Project. MNA also argued that Shell's approach to capacity funding was not equitable because Shell had provided significant funding to several First Nations, including FMFN, ACFN, and MCFN, but not to MNA or the Métis locals it represented.

[1508] Shell stated that the funding it provided to Fort McKay was for both the FMFN and the Fort McKay Métis (Local 63/FMMCA). Shell said that it provided funding to Fort McKay because it is the community closest to the Project and is therefore the community most likely to be directly affected by the Project.

[1509] Shell acknowledged that it had not provided any capacity funding to MNA, but also stated that the role of MNA with respect to representing the Métis locals was not clear. Shell said that its approach had been to work directly with the Métis Locals. Shell also noted that MNA had received $80 000 in funding from CEAA to allow it to participate in the review process.

[1510] MNA stated that it was working with Métis locals to complete a preliminary assessment of the direct effects of the Project on Métis activities and rights. MNA stated that all Métis locals need to be consulted because they do not know where their members may be practising their rights and no TLU studies have been completed.

[1511] MNA acknowledged that it had received funding from CEAA but said that this funding was for participation in the review processes for both the Project and the Pierre River Mine. MNA stated that although it appreciated the funding, the $40 000 provided by CEAA for this proceeding would only partially cover the cost of retaining consultants, experts, and legal counsel and was not sufficient to enable MNA to complete the mapping, TLU, and TEK studies required to effectively understand the impact of the Project on the Métis. MNA argued that the lack of capacity funding is a key concern for MNA and that it simply does not have the resources available to define the TEK and TLU information related to Shell's application. MNA also said that the ERCB has never awarded advanced funding to Métis groups.

[1512] Fort Chipewyan Métis Local 125 stated that it does not have the capacity to effectively participate in the review of large projects such as this one. Métis Local 125 reported that it has only an office manager and one part-time assistant to support the president and help manage the affairs of the local. Métis Local 125 said that it had submitted a request for capacity funding to Shell in July 2012 but that Shell had not provided the requested funding.

[1513] Shell stated that it was a major contributor to the *Mark of the Métis* study. Shell also said that it had provided funding to Métis Local 125 in 2009 for a TLU study and that in June 2012, Shell agreed to provide additional funding to Métis Local 125 so that it could complete the TLU study.

[1514] Métis Local 125 said that it had completed the *Métis Use and Occupancy Study* in October 2012 and acknowledged that Shell had provided some of the $300 000 funding requested by Métis Local 125 for the study.

[1515] Shell believed that it was responsive to funding requests from the Métis locals. Shell said that since 2007, it had provided more than $700 000 to Métis Locals 125 and 1935. Shell stated that since 2009, it had paid or committed to pay over $260 000 to Métis Local 125 and since 2007 had provided roughly $441 000 to Métis Local 1935. Shell acknowledged that this was not the core consultation funding that the Métis Locals were looking for, but was provided in response to specific needs identified by those Métis Locals.

[1516] Shell stated that although it had been meeting and consulting with Métis Local 125 up until August or September 2012, the local had not identified any problems related to capacity funding up to that point in time. Shell stated that it had recently agreed to provide funding to Métis Local 125 to help with the cost of participating in this regulatory process, but acknowledged that this occurred very late in the process because the local raised its concerns only very recently. Shell stated that the request by Métis Local 125 for technical consultants to help with review of the Project had also not been made until very recently.

Adequacy of Consultation by the Crown

[1517] MNA asserted that the Government of Alberta has not engaged in consultation with any Métis people with respect to the Project and has not upheld its duty to consult with the Métis people whose rights will be impacted by the Project.

[1518] MNA said that the duty to consult requires the Crown to consult with and, where appropriate, accommodate Métis rights and interests when considering initiating conduct that might adversely affect Métis rights, interests, or ways of life or the sustainability of lands the Métis rely on. MNA argued that the duty to consult is triggered when the Crown has real or constructive knowledge of the potential existence of credible Métis rights claims and it contemplates conduct that might adversely affect those rights, including issuing an approval for the use of Crown land that is inconsistent with the Aboriginal interest.

[1519] MNA argued that Métis rights are collective rights and because it is the Métis community that holds rights, it is the community that needs to be consulted with respect to potential impacts on Métis rights and interests. MNA said that the duty to consult and accommodate is not fulfilled by government or proponents talking to individual Métis citizens or individual Métis Elders or harvesters. MNA also said that before consultation can properly occur, the rights that are impacted need to be understood.

[1520] MNA argued that Shell has not fulfilled the EIA TOR or the Panel's TOR and therefore cannot be said to have relieved the Crowns of its obligation to consult and/or accommodate the impacts on the Aboriginal rights asserted.

[1521] MNA said that the Government of Alberta has never approached the Métis to discuss the impacts of the oil sands. MNA argued that notwithstanding that it has rights that must be protected under section 35, it receives less consultation than would be received by nonrights-bearing stakeholders. MNA said that it wants the Government of Alberta to recognize that the Métis are Aboriginal people and to fulfill the duty of the Crown.

[1522] MNA believed that the Government of Alberta does not use the same standard for consultation with Métis people as it does for First Nations people. To support its assertion, MNA pointed to AENV's rejection of Métis Local 1935's statement of concern because the information provided did not clearly identify how more than one member or family of Métis Local 1935 would be directly affected by the Project. MNA said that, on the other hand, AENV had accepted FMMFN #468's statement of concern despite a similar lack of detail or specific concerns.

[1523] MNA also expressed concern that AENV rejected Métis Local 1935's statement of concern even though it was clear that a lack of capacity made it very difficult for Métis Local 1935 to review the Project and assess its impacts. MNA noted that despite a significant lack of capacity in most Métis communities, Alberta does not have a capacity funding program for the Métis.

[1524] MNA noted that the Government of Alberta's *First Nations Consultation Policy* is for First Nations only and none of the consultation requirements in the policy apply to Métis people. MNA believed that a Métis consultation policy is required and noted that CAPP recommended that Alberta develop a Métis consultation policy in its October 2010 submission regarding the Alberta Regulatory Enhancement Project.

[1525] MNA stated that it believed that both industry and government discount the views and interests of Métis people and that they are treated as a people without rights. MNA said that Canada appears to view Métis rights and consultation as a provincial matter while the provinces see it as a federal issue, resulting in a political limbo for the Métis people.

Effects to Traditional Land Use, Rights, and Culture

[1526] MNA was concerned that Shell's EIA focuses only on TLU information provided by FMFN, ACFN, and MCFN and that Shell incorporated no Métis-specific TEK or TLU information into the EIA. MNA said that Shell had not made reasonable efforts to include Métis specific information in the EIA and ignored the information that was available. MNA said that the work that was completed for the *Mark of the Métis* study was available but not included in the EIA even though Shell knew of the study.

[1527] MNA said that Shell made few references to the Métis in its EIA and those that were made were for the most part incorrect because they referred to Métis individuals as nonaboriginal or as members of a First Nation.

[1528] MNA said that interviews with specific individuals or one Métis local does not give a complete picture of what needs to be protected. MNA said that even though Shell may have interviewed a few Métis rights-holders living in Fort McKay, Shell excluded other Métis rights-holders living in the region who harvest in the Project area. MNA, therefore, argued that Shell's application was not complete in accordance with the Panel's TOR. MNA said that although the TOR require evidence on the potential effects on asserted Aboriginal rights, Shell excluded the Métis people from its application.

[1529] Shell acknowledged that references to First Nations in the EIA do not generally include Métis, except for references to Fort McKay or the FMFN because FMFN included information from Fort McKay Métis in the TEK and TLU information it provided to Shell. Shell believed however, that the TLU activities of the Métis and First Nations were similar enough that the TLU gathered from the First Nations and used in the EIA would allow for an assessment of potential effects to Métis TLU. Shell acknowledged however, that it had only incorporated Métis TEK and TLU information and assessed the effects to Métis TLU indirectly in the EIA.

[1530] MNA provided evidence regarding historic and current Métis use of the general Project area. Barb Hermansen, a Métis person and author of the book *Barb Hermansen: Her Story*, provided an account of growing up on a trapline along the Athabasca River. Key areas of historic and current use included areas along the Athabasca River, areas to the north of the Jackpine area and north of McClelland Lake, and areas on the west side of the Athabasca River in the general vicinity of the proposed compensation lake.

[1531] MNA also provided the *Mark of the Métis* study as evidence of land use in the Project area. The *Mark of the Métis* study shows that in the vicinity of the Project, most of the use by the Métis occurs on the north shore of McClelland Lake. MNA also indicated that its members use the area along the Athabasca River from the oil sands region north to Fort Chipewyan.

[1532] Shell noted that the *Mark of the Métis* study indicated only one TLU site in the vicinity of the Project, which was a moose hunting site.

[1533] MNA was concerned that Shell had not considered the historic use of traplines by the Métis. MNA explained that traplines are often passed from one generation to another through kinship ties. The traplines are also sometimes shared with family members, other Métis, or members of First Nations.

[1534] Shell said that it used the TLU information collected and incorporated it into its EIA to assess impacts to current land users, not historic users, and that this was consistent with the practice used for EIAs. Shell stated that the information presented by MNA on historic use of the area by the Métis is only relevant if the intent is to establish rights and this seemed to be consistent with MNA's concerns about the lack of a Métis consultation policy. Shell observed that most of the current Métis use presented by MNA is considerably north of the Project area.

[1535] MNA explained that the Métis currently use the Project area south of McClelland Lake for a variety of uses such as hunting, trapping, and gathering of plants. MNA stated that the area is unique and the Métis cannot go just anywhere to collect plants, especially medicinal plants.

[1536] Shell stated that the maps in the *Mark of the Métis* study and other evidence filed by MNA does not show significant activity to the south of McClelland Lake and in the Project area.

[1537] MNA said that Métis members would hunt in the oil sands area in the past but that several of them had stopped using the oil sands area for TLU because of industrial activity. MNA stated that the nearby Albian lease was an area where moose could be hunted in the past.

[1538] MNA said that there are still caribou in the Project area and around McClelland Lake as some Métis persons saw several caribou in the area in autumn 2012.

[1539] MNA indicated that the Métis have trouble accessing traditional use areas because, unlike the First Nations, the Métis do not have agreements with the oil companies. The MNA stated that a large number of the relatives of the Métis are members of a First Nation and use the same areas. MNA stated that the Métis would like to be treated the same way as the First Nations.

[1540] MNA was concerned about air quality, specifically the emissions from oil sands plants because members noticed black layers of snow around McClelland Lake. MNA members believed that the air pollution generated from the oil sands industry is responsible for changes in the number of birds in the region.

[1541] MNA was also concerned about the quality of surface water. MNA stated that its members were once able to drink the surface water but due to concerns about contamination there is a growing need to carry water when going on the land. There is a concern that all the drinkable surface water will eventually be contaminated and this will be an impediment to Métis land use.

Analysis and Findings

Rights Being Asserted

[1542] The Panel notes that a significant amount of the evidence submitted by MNA concerned its historic, rather than current, use of the land. The Panel concludes that this was intended to provide support for MNA's assertion that it has constitutional rights derived from historic Métis communities in the region.

[1543] The Panel is of the view that regulatory proceedings for individual projects are not the appropriate forum in which to seek a confirmation of legal rights under the *Constitution Act*, 1982. These are complex legal issues that more properly belong before the courts.

[1544] The Agreement requires the Panel to consider the effects of the Project on asserted or established Aboriginal and treaty rights, to the extent the Panel receives such information. The Panel notes MNA's assertion that the Métis have rights under s. 35(1) of the *Constitution Act, 1982*. The Panel has not made any determinations as to the validity of the Aboriginal or treaty rights being asserted by MNA or the strength of such claims but for the purposes of assessing the potential effects of the Project on MNA's Aboriginal and treaty rights, the Panel accepts that MNA has the rights being asserted.

Consultation

[1545] The Panel notes that Shell has good neighbour agreements with Métis Locals 125 and 1935 and consulted with these locals even though consultation requirements for Métis are not addressed in Alberta's *First Nations Consultation Policy*. The Panel notes that Shell met with Métis Locals 125 and 1935 on numerous occasions since 2007 and believes that there have been numerous opportunities for Locals 125 and 1935 to learn about the Project and to provide input to Shell.

[1546] The Panel believes that the role of MNA with respect to representing the Métis Locals has been unclear and in particular notes the July 23, 2012, letter from Métis Local 125 stating that MNA does not act for it and that only Métis Local 125 can speak for its rights. While MNA provided some clarity about its role at the hearing, the Panel believes that Shell's approach of working directly with the Métis locals was appropriate based on the information it had at the time.

[1547] The Panel believes that capacity is an issue that makes it difficult for the Métis locals to provide detailed, project-specific TLU information for use in assessments and to effectively participate in the review of projects such as this one. The Panel believes that Shell has been responsive to requests from Métis locals for support for community-led TLU studies and other initiatives. While Shell did not provide funding for project-specific TLU studies or technical reviews, or core capacity funding, it appears that these requests were not made until shortly before the hearing began. The Panel also notes that there is no requirement for individual proponents such as Shell to provide core capacity funding and that MNA did not apply to the Panel (as the ERCB) for an advance of local intervener costs.

[1548] Recognizing the lack of capacity within Métis Locals 125 and 1935, the Panel finds that MNA provided very limited evidence of current Métis use of the immediate Project area. The Panel, therefore, concludes that Shell's approach to consultation with the Métis Locals was reasonable and appropriate.

[1549] The Panel acknowledges the concerns of MNA and Métis Locals 125 and 1935 about what they perceive as a lack of recognition of Métis rights and consultation by Alberta and Canada concerning the Project and the cumulative impacts of oil sands development on Métis land use and rights in the oil sands region. The Panel also acknowledges MNA's concerns about the absence of a Métis consultation policy and core capacity funding in Alberta.

[1550] The Panel believes that if government wants to streamline regulatory proceedings, clarifying expectations and providing guidance with respect to Métis consultation would be helpful. The regulatory process would be more efficient if interveners did not find it necessary to advance their arguments related to Aboriginal rights and Crown consultation in the regulatory proceedings for individual projects. The Panel, therefore, recommends that Alberta consider developing a Métis consultation policy that outlines expectations and provides guidance with respect to Métis consultation.

[1551] The Panel stated at the outset of the hearing that it would not rule on the adequacy of Crown consultation as it did not have the jurisdiction to do so, and even if it did have the jurisdiction, it would be premature to do so as there would be further opportunities for consultation before Crown decisions are made or authorizations issues for the Project.

[1552] The Panel has included a recommendation that before other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with Aboriginal groups, including Métis groups, in light of the issues identified in this report to determine whether additional consultation by the Crown is necessary to address significant adverse Project and cumulative effects to a number of resources important to Aboriginal people and likely significant adverse cumulative effects on Aboriginal land use, rights, and culture.

Effects to Traditional Land Use, Rights, and Culture

[1553] The Panel finds that it is unclear how and to what extent Shell incorporated or considered Métis TEK or TLU information in its assessment. Except for the information provided by Fort

McKay that incorporates information provided by the Fort McKay Métis, Shell's EIA makes few specific references to Métis TEK or TLU information. Shell's EIA and cultural assessment also do not provide a specific assessment of the effects of the Project on Métis TLU or discuss specific impacts on Métis Locals 1935 or 125. While the Panel accepts that TLU information collected from First Nations may be somewhat representative of Métis TLU, the Panel believes that a more explicit treatment of Métis TEK and TLU information and assessment of impacts on Métis TLU and rights would have been helpful. The Panel understands, however, that some of the Métis TLU studies were not available when Shell submitted its EIA in 2007 and have only become available recently. In assessing the potential effects of the Project on Métis TLU, the Panel has relied on the information provided by both Shell and MNA.

[1554] The Panel notes that the evidence presented by MNA shows significant historic use of the Athabasca River, areas to the north of the Jackpine Project and north of McClelland Lake, and areas to the west of the Athabasca River by Métis people. While Métis members represented by MNA reported some current use of the immediate Project area including the area of the proposed Redclay Compensation Lake, generally the Panel found that there was limited evidence of current use of the immediate Project area. Most of the current Métis use occurs outside the Project LSA on the north side of McClelland Lake and elsewhere in the RSA.

[1555] The Panel also notes that no traplines in the immediate Project area are currently held by a Métis member represented by MNA. The Panel recognizes that traplines are often passed from one generation to another through kinship ties and that this suggests the possibility that ownership of traplines in the Project area could transfer to other Métis individuals in the future. However, the Panel does not believe it is appropriate to base its findings on future events that are highly uncertain.

[1556] The Panel, therefore, concludes that while the Project may result in adverse effects on the TLU activities of some Métis individuals, the direct effects of the Project are unlikely to result in significant adverse effects on Métis TLU or rights.

[1557] The Panel does note MNA's concerns that it has trouble accessing areas for traditional use because the Métis do not have agreements with industry. The Panel therefore recommends that the Government of Alberta require Shell to offer to enter into access agreement discussions with MNA and the Métis Locals to provide for Métis access to areas of TLU.

[1558] The Panel recognizes that the Project would occur within the general traditional use area of some of the Métis represented by MNA. The Panel also acknowledges MNA's concerns regarding the cumulative impacts of the oil sands industry on water and air quality, wildlife, and TLU activities of the Métis. The Panel notes that some of the Métis represented by MNA provided evidence of avoidance of use in the vicinity of the Project. The Panel understands that previous and ongoing oil sands activities in the area may have contributed to avoidance of use by the Métis and may therefore account in part for the absence of current use in the vicinity of the Project.

[1559] The Panel has determined that the Project in combination with other existing, approved, and planned projects and activities, is likely to have a significant adverse cumulative effect on some terrestrial resources important to Aboriginal groups, including wetlands, old-growth forests, traditional plant potential, biodiversity, wetland- and old-growth-dependant species at risk and migratory birds, and caribou. The Panel has also concluded that the Project is likely to result in significant adverse cumulative effects on Aboriginal TLU in the region surrounding the Project. Even though there is limited evidence of current use in the Project area, the Panel concludes that the Project is also likely to result in significant adverse cumulative effects on such Métis TLU in the broader area surrounding the Project.

Non-Status Fort McMurray/Fort McKay First Nation (NSFMFM) and the Clearwater River Paul Cree Band #175 (Clearwater Band)

Evidence

Participation and Requested Disposition

[1560] The participation of the NSFMFM and Clearwater Band in the review process and hearing is discussed in the Participant Involvement in the Review Process section.

[1561] John Malcolm testified that he was the interim Chief of the NSFMFM and the Band Manager of the Clearwater Band and was authorized to represent the NSFMFM and Clearwater Band's interests with respect to consultation and environmental assessment of the project.

[1562] The NSFMFM and Clearwater Band were concerned about the effects of the Project on their TLU, culture, socioeconomic conditions, air quality, and traditional food. They were also concerned about the recognition of their Aboriginal and treaty rights and the adequacy of consultation by Shell, Alberta, and Canada. The NSFMFM and Clearwater Band asked the Panel to recommend that the application not be approved until they have been adequately consulted on their rights with respect to the Project and until their concerns regarding how the Project will impact them are fully addressed.

[1563] The NSFMFM and Clearwater Band made several recommendations to the Panel. Appendix 8 provides a summary of key NSFMFM and Clearwater Band recommendations.

Rights Being Asserted

[1564] The NSFMFM stated that it was comprised of over 600 members and that its members are Cree and Chipewyan peoples whose ancestors have lived in and around the Athabasca region and in the vicinity of the Project for thousands of years, from before the signing of Treaty No. 8 in 1899, until the present day. The NSFMFM testified that the Fort McKay Band emerged in or about 1948 and was formerly part of the Fort McMurray Band. The NSFMFM asserted that the members of the NSFMFM are not members of other existing bands recognized by the Crown as Indian Bands within the meaning of the *Indian Act* but that nearly all of its members are entitled to be registered as Indians under the *Indian Act* and each member of the NSFMFM has a sufficient and substantial ancestral connection to Aboriginal persons that were listed on the Fort McMurray and Fort McKay paylists as adherents to Treaty 8.

[1565] The NSFMFM indicated that its members currently live in Fort McMurray, Anzac, Fort Chipewyan, and other communities in and around the Project area, where they have and continue to fish, hunt, and conduct other traditional activities protected pursuant to Treaty 8 from before its execution until the present day. The NSFMFM stated that in addition to carrying on hunting, trapping, fishing, or gathering activities together, elders and members of the Band hold ceremonies and conduct meetings to affirm the continued expression of the group and its rights.

[1566] The Clearwater Band stated that its membership includes about 20 living members who are the direct descendants of Paul Cree. The Clearwater Band asserted that its living members are "Indians" that are registered or entitled to be registered under the *Indian Act* and that they hold established rights under Treaty No.8 to hunt, fish, trap, and undertake other traditional activities throughout Alberta, and specifically within their traditional territory and in the immediate vicinity of the Project. The Clearwater Band indicated its members currently reside in communities in the Athabasca region, including Fort Chipewyan and Anzac.

[1567] The NSFMFM and Clearwater Band asserted that they have rights under section 35(1) of the *Constitution Act*, 1982 as well as Treaty 8 which provides for the protection of the Indians' "usual vocations of hunting, trapping, and fishing" throughout the treaty territory. Both the NSFMFM and Clearwater Band expressed concern that their Aboriginal and treaty rights will be severely impacted by the direct and indirect effects of the Project.

Adequacy of Consultation by Shell

[1568] The NSFMFM and Clearwater Band stated that attempts to engage with Shell directly about the Project were "fruitless." Mr. Malcolm stated that attempts had been made to have discussions with Shell, however, Shell had little interest in these discussions because it was not required by the governments to consult with the nonstatus groups and therefore they were not afforded the same consultation and accommodation treatment that the other Aboriginal groups were. Mr. Malcolm stated that he did not like the way government and industry created divisions between the different Aboriginal groups and treated them differently. Mr. Malcolm suggested that his people "have been here all along" and as such should be consulted like other Indians. Mr. Malcolm also stated that once the hearing was announced for the Project, Shell indicated that it was willing to discuss only the PRM.

[1569] Mr. Malcolm indicated that to date Shell's consultation had consisted only of Shell providing information to him about the Project. Mr. Malcolm stated that the NSFMFM and Clearwater Band lacked the capacity to meaningfully review this information and that despite requests, Shell had not provided any capacity funding to the NSFMFM and Clearwater Band to complete a technical review of the application. Mr. Malcolm further suggested that for meaningful consultation to occur, funding for an IRC (Industry Relations Corporation) was required.

[1570] Shell disagreed with Mr. Malcolm's characterization of its consultation efforts with the NSFMFM and Clearwater Band. Shell stated that notwithstanding that the groups represented by Mr. Malcolm have been found by the federal and provincial governments to not have Aboriginal rights that would be affected, Shell did consult with them. Shell stated that until quite recently these groups had not raised any concerns about the Project. Shell stated that it had engaged with the groups represented by Mr. Malcolm and this was evidenced by Shell's letter to Mr. Malcolm dated January 18, 2012, in which Shell agreed to a process for phased consultation and a proposed scope of work prepared by a consultant working for Mr. Malcolm. Shell also stated it would continue to consult the groups represented by Mr. Malcolm about both the Project and the PRM after the Project hearing.

[1571] Shell responded that the criteria Shell used to establish the need for and scope of capacity funding for the NSFMFM and Clearwater Band was the same criteria Shell used for other Aboriginal groups. Shell stated that the identification of potential project-related impacts is required for funding and that Mr. Malcolm had only identified concerns with oil sands development in general, as opposed to specific concerns related to the Project.

[1572] The NSFMFM and Clearwater Band expressed concern that Shell's EIA for the Project does not mention the serious adverse effects the Project will have on the rights of the NSFMFM and Clearwater Band. The NSFMFM and Clearwater Band argued that the EIA contains Shell's view of the anticipated impacts on traditional knowledge and land use activities of First Nations based on consultation with the FMFN and Métis, ACFN, MCFN, and to a lesser extent on individual holders of RFMA. The NSFMFM and Clearwater Band expressed concern that the EIA does not take into account the TEK of the NSFMFM or Clearwater Band, nor have the environmental impacts on their traditional practices been considered.

[1573] The NSFMFM and Clearwater Band argued that they have suffered from the historic and ongoing impacts of oil sands activity to an even greater extent than the Aboriginal groups identified in the EIA due to the refusal of the Crown or industry to provide recognition, consultation, accommodation, and impact-benefit agreements.

Adequacy of Consultation by the Crown

[1574] The NSFMFM and Clearwater Band expressed concern that neither Alberta or Canada have consulted with the NSFMFM or Clearwater Band about the anticipated adverse impacts of the Project or oil sands activity more generally on their established and asserted treaty rights. According to the NSFMFM and Clearwater Band, their rights remain unrecognized and because of this they remain marginalized and disenfranchised with respect to the environmental assessment process.

[1575] On December 16, 2011, the NSFMFM and Clearwater Band wrote to the Governments of Alberta and Canada outlining their concerns about the potential impact of the Project on their asserted rights under section 35(1) of the *Constitution Act*, 1982. In this letter the NSFMFM and Clearwater Band requested consultation with Crown decision makers and a preliminary assessment by both Alberta and Canada of the strength of claim and severity of impacts on rights for both of the groups, including a clear description of the evidence and reasons supporting its conclusions. The letter also included a request for participant funding under the Agency's Aboriginal funding envelope for both the NSFMFM and Clearwater Band to facilitate consultation and participation in the environmental assessment process.

[1576] Alberta responded to the NSFMFM and Clearwater Band in a letter from the Alberta Department of Justice and Attorney General dated January 19, 2012. In its response, Alberta confirmed that the NSFMFM and Clearwater Band were not recognized Indian Bands, and as such, no duty to consult was owed to either group. The letter also stated that Shell had been directed to consult with Fort McMurray #468 First Nation and the Fort McKay First Nation and that members belonging to either one of these recognized Indian bands could raise their concerns through the leadership of these bands.

[1577] Canada responded to the NSFMFM and Clearwater Band in a letter from the Agency's Crown consultation coordinator dated February 17, 2012. In its letter, Canada stated that based on the information provided, neither the NSFMFM nor the Clearwater Band were an entity to whom a duty to consult was owed. The letter stated that the NSFMFM and Clearwater Band were not recognized historical collectives, distinct communities of individuals with collective treaty or Aboriginal rights, or bands under the *Indian Act*. The letter went on to state that even though the NSFMFM and Clearwater Band were not entitled to consultation under section 35 of the *Constitution Act*, 1982, they were not precluded from participating in the Panel process. The letter indicated that both groups would have a significant opportunity to make their views known, and to have their views meaningfully considered, by providing information directly to the joint review panels convened by the Minister of the Environment and the Energy Resources Conservation Board for the Shell Jackpine and Pierre River projects. The letter suggested that through this participation the NSFMFM and Clearwater Band may express their views respecting the potential impacts of the projects on their members' interests and to this end the Agency awarded $83 990 under the public participation envelope to support the groups' participation in the Joint Review Panel process.

Effects on Traditional Land Use, Aboriginal Rights, and Culture

[1578] The NSFMFM and Clearwater Band stated that the Project is an area where their members have and continue to hunt, fish, and gather pursuant to their Aboriginal and treaty rights. The NSFMFM and Clearwater Band also stated that their members historically trapped in the Project area in accordance with their trapline rights. They believe that their rights will be severely restricted or destroyed by the Project and are concerned that impacts to their traditional activities and rights have not been specifically considered in any of the Project studies or consultation completed by Shell.

[1579] The NSFMFM and Clearwater Band provided some anecdotal evidence to support their claims of historic and current traditional use of the Project area. John Malcolm stated that he trapped in the Project area in the past and that his father continues to hunt in the Project area. The NSFMFM reported that members hunted moose within the Project site area and that there are still some moose although not as many as before. An elder recounted that some of his father's favourite moose hunting was on pine ridges and large stands of birch on the proposed Project site and that other resources in the Project area included chickens (grouse), rabbits, blueberries, and low-bush cranberries. The Clearwater Band asserted that a member of the Clearwater Band held trapline number 1714 and that in the recent past, ACFN, Fort McKay, and the Clearwater Band shared trapline 1714.

[1580] The NSFMFM stated that although RFMA licences provide the holder with the exclusive right to trap within the RFMA, the lands encompassed by the RFMA license are traditional lands and other users do not need the permission of the trapline holder to use it for hunting, harvesting, or for other traditional uses. The NSFMFM argued that it was not appropriate to provide compensation to the trapline holder as mitigation and then ignore the other traditional users.

[1581] The NSFMFM and Clearwater Band stated that preservation of fish, birds, and wildlife habitat are crucial to the continued sustainability of their members' ability to practice their traditional activities. The NSFMFM and Clearwater Band expressed concern that the Project would destroy old-growth forests and the populations of wildlife that depend on old-growth forests.

[1582] Mr. Malcolm stated that woodland caribou play an important role in the traditional use activities and culture of NSFMFM and Clearwater Band members. NSFMFM and Clearwater Band members reported that caribou were more abundant 20 years ago than they are today but based on observations of their members, caribou do still occur within the LSA. The NSFMFM and Clearwater Band reported that there are some sources of salty water on Shell's lease and that this salty water attracts caribou. NSFMFM and Clearwater Band members are of the opinion that the sources of salty water are important to the animals and will be lost because of the Project. The NSFMFM and Clearwater Band also believe that the muskeg within the Project site provides an important calving area for caribou.

[1583] The NSFMFM and Clearwater Band were concerned that while woodland caribou are listed federally under the *SARA* as threatened and are listed provincially under the *Wildlife Act* as at risk, Shell's EIA for the Project indicates that high value woodland caribou habitat will be directly impacted by the Project if it is approved as proposed. The NSFMFM and Clearwater Band are concerned that despite the importance of caribou to the traditional use and culture of Aboriginal groups and the at risk status of caribou under both federal and provincial legislation, caribou were not considered a key indicator resource in the EIA for the Project. The NSFMFM and Clearwater Band also expressed concern about the lack of mitigation measures to avoid significant adverse effects on caribou populations in Shell's EIA. The NSFMFM and Clearwater Band are concerned that without protection the caribou will decline to extinction and a resource important to their members will be lost.

[1584] The NSFMFM and Clearwater Band believe that wildlife are stressed because of the fragmentation and destruction of their habitat by seismic lines, noise, lights, vibration and rumbling that can be felt at a distance of several kilometres. They were of the opinion that these disturbances are now everywhere in the RMWB.

[1585] The NSFMFM and the Clearwater Band stated that because the Project area is already disturbed and there are many people working in the area, hunting is considered unsafe and these factors contribute to members avoiding the use of the area.

[1586] The NSFMFM and the Clearwater Band believed that muskeg supports the surrounding ecosystem by acting as a water purifier, by controlling water redistribution in the ecosystem, and by helping to control water temperatures in streams, rivers, and fish nurseries. They also believe that muskeg is crucial for fish and fish habitat in the region as it acts as a fish nursery. The NSFMFM and Clearwater Band are concerned that removing significant amounts of the muskeg from the Project area will cause the loss of filtering, water retention, and thermal buffering capacity and that the water temperature in the lakes and streams will rise. The NSFMFM and Clearwater Band are concerned that a rise in water temperature may result in more outbreaks of blue-green algae similar to the one that closed Willow Lake and that a change in temperature of the Muskeg River caused by the removal of the muskeg will affect fish. The NSFMFM and Clearwater Band are concerned that after reclamation, site drainage will not have a similar level of attenuation from muskeg as it will rely more heavily on lake storage. They do not believe that the implications of muskeg removal on water colour and temperature have been properly incorporated into the ecological effects assessment in the EIA.

[1587] The NSFMFM raised concerns about surface water quality, indicating that in preindustrial times its members could drink the water and melt ice from the Athabasca River to use as drinking water but they could no longer do so due to concerns about contamination. They also expressed concerns that EPLs may leak into the Athabasca River and contaminate the aquifer.

[1588] The NSFMFM and the Clearwater Band identified concerns regarding existing and future wastewater discharges and seepage and the potential for these discharges and seepage to affect aquatic species. In particular, Mr. Malcolm expressed concern that the Project would result in additional sewage going to the Regional Municipality of Wood Buffalo's sewage lagoon at Fort McMurray, either by truck from work camps or through an increased population of workers living in Fort McMurray. Mr. Malcolm expressed concern that this additional sewage could result in increased loading of nutrients or contaminants to the receiving environment and that this could affect aquatic species in the Athabasca River such as frogs and clams.

[1589] Shell stated that it noted an abundance of frogs in the Athabasca River and some toads. Shell stated it was not aware of the existence of any studies on fresh water clams in the Athabasca River and that Shell had not conducted any studies on clams.

[1590] NSFMFM stated that that the industrial activities in the Project area and in the oil sands region generate odours and its members are concerned about the toxicity of the air. The NSFMFM and Clearwater Band stated that while they use the lease area for their traditional activities, it is not encouraged because of the fear of contamination of the traditional resources. NSFMFM and Clearwater Band were of the opinion that the Project will add to the current odours and toxicity of the surrounding environment.

[1591] The NSFMFM and Clearwater Band were concerned that the EIA does not examine in any detail how the traditional practices of the NSFMFM and Clearwater Band have and will be affected by the degradation of wildlife and fish habitat, diversity and abundance, by the rapid decline of caribou and other species at risk and by the health and safety risks associated with increased toxicity levels in the air, water and traditional resources. The NSFMFM and Clearwater Band stated that by interfering with their TLU, the oil sands projects are contributing to a loss of their culture and traditions.

[1592] Mr. Malcolm reported that he has read historical and archaeological reports on a traditional resource called "pipestone." Mr. Malcolm explained that pipestone is a general term used to describe a type of mud and sandstone rock that is used to make ceremonial or peace pipes. Mr. Malcolm stated that pipestone has been identified as a traditional cultural resource important to his ancestors and is believed to occur in the Project area. NSFMFM and Clearwater Band members are concerned that this resource has not been adequately studied and there is no mention of pipestone in the EIA for the Project.

[1593] The NSFMFM and Clearwater Band identified a type of fungus that grows on diamond willows and is reportedly found along river banks in the Project area. Mr. Malcolm stated that the diamond willow fungus is used as incense and is a traditional resource with significant ceremonial and medicinal purposes. The NSFMFM and Clearwater Band expressed concern that this resource was not mentioned in the EIA and they would like to harvest the diamond willow fungus in the Project area before it is cleared should the Project be approved.

[1594] According to the NSFMFM and Clearwater Band, there may be some undiscovered mass grave sites along the Athabasca River near Fort Hills, not far from Shell's lease or Poplar Point, resulting from the 1916–1918 influenza epidemic. The NSFMFM and Clearwater Band believe that that the gravesites may contain the remains of their ancestors and expressed concern that the potential for mass graves were not addressed in the EIA for the Project and that proper archaeological studies have not been done on these resources.

[1595] The NSFMFM and Clearwater Band were concerned that Cree Burn Lake was located on the Jackpine lease site and may be destroyed by the Project. The NSFMFM and Clearwater Band stated that they would like the Pierre-au-Calumet, the Quarry of the Ancestors, and the Cree Burn Lake sites protected.

[1596] Shell confirmed that the Cree Burn Lake and its associated gravesites are not within the Project mine site.

[1597] The NSFMFM and Clearwater Band stated that housing prices in Fort McMurray have risen extremely high and that there is no affordable housing available in the area. Mr. Malcolm stated that housing pressures in the Fort McMurray area are leading to homelessness and are destroying the ability of Aboriginal people to continue to live in the area. The NSFMFM and Clearwater Band believe that the Project will further increase pressures on the cost and availability of housing and this may result in members of these groups being forced from their residences and from their traditional lands. The NSFMFM and Clearwater Band suggested that there has not been sufficient accounting or follow-up studies on whether donations to the community by Shell to address the homeless problem have been successful.

Analysis and Findings

Rights Being Asserted

[1598] The Panel notes the assertion of the NSFMFM and Clearwater Band that they have rights under section 35(1) of the *Constitution Act*, 1982 and Treaty 8 and are therefore owed a duty of consultation by the Crown. The Panel also recognizes that some of the evidence and argument provided by the NSFMFM and Clearwater Band during the hearing was intended to support their assertion of constitutional rights.

[1599] Alberta and Canada have both provided submissions that clarify their position that the NSFMFM and Clearwater Band are not recognized bands under the *Indian Act* and that as such, are not owed a duty of consultation by the Crown. The Panel also notes that Mr. Malcolm has participated in numerous previous regulatory proceedings for oil sands projects on behalf of similar groups, seeking recognition of the groups' rights claims.

[1600] Pursuant to paragraph 6.3 of the TOR, the Panel is not required to make any determinations as to the validity of Aboriginal or treaty rights or the strength of such claims. The Panel has however, considered the effects of the Project on the TLU and activities of the NSFMFM and Clearwater Band.

Consultation

[1601] The Panel believes that Shell's approach to consultation with Mr. Malcolm and the members of the NSFMFM and Clearwater Band was appropriate in the circumstances. Although Alberta and Canada both found that the NSFMFM and Clearwater Band were not recognized bands under the *Indian Act* and consequently did not have rights that would be affected by the Project, Shell made efforts to engage with these groups. It is apparent from the evidence that Shell provided information about the Project to Mr. Malcolm and there were numerous exchanges and opportunities for Mr. Malcolm and the members of the NSFMFM and Clearwater Band to learn about the Project and to identify potential concerns.

[1602] Although Shell did not provide capacity funding to either the NSFMFM or Clearwater Band, there is no legal requirement for them to do so and the Panel accepts Shell's argument that for project-specific funding to be provided, there needs to be some credible expectation that the rights of the group could be affected by the project.

Effects on Traditional Land Use, Rights, and Culture

[1603] The Panel notes that Shell did not specifically assess the effect of the Project on the TLU and activities of the NSFMFM or Clearwater Band in the EIA for the Project.

[1604] The Panel agrees with the NSFMFM and Clearwater Band that providing compensation to the trapline holders without considering the land use of other traditional users may not adequately mitigate or compensate for other losses of traditional use.

[1605] The Panel found that while the NSFMFM and the Clearwater Band provided evidence that some of their members have and continue to use the Project area for some of their traditional activities, the information presented on historic and current use of the Project area was quite limited and largely anecdotal. Additionally, the Panel found that the NSFMFM and Clearwater Band provided little evidence that the traditional activities currently exercised in the Project area, such as moose hunting or gathering of cranberries or blueberries, could not be practiced outside the Project area.

[1606] The Panel notes that while the NSFMFM and Clearwater Band expressed concern about the potential impacts of the Project on pipestone, they did not present any evidence to indicate that the specific type of mud and sandstone known as pipestone is particularly rare or only occurs in the Project area. Furthermore, the NSFMFM and Clearwater Band did not provide any evidence to suggest that access to deposits of pipestone were currently limited or continued to be important for the practice of traditional activities and culture of its members.

[1607] The Panel also notes that while NSFMFM and Clearwater Band identified the importance of willow fungus to it members, they did not provide any evidence that diamond willow fungus is particularly rare or restricted to the Project area. Furthermore, the Panel believes that there will be time to collect diamond willow in advance of operations should the Project be approved, considering that mining along the Muskeg River and some tributaries will not occur for many years.

[1608] The Panel notes that the Pierre-au-Calumet, Quarry of the Ancestors, and the Cree Burn Lake sites are not located within or immediately adjacent to the Project footprint and will not be disturbed by the Project.

[1609] The Panel notes the concerns of the NSFMFM and Clearwater Band about the potential effects of the Project on wildlife and fish habitat, diversity, and abundance and the particular importance of caribou to the NSFMFM and Clearwater Band members. The Panel also acknowledges the concerns expressed about the regional cumulative effects of the oil sands industry on wildlife habitat disturbance and wildlife diversity. The Panel concluded that Project effects are likely to result in significant adverse effects to wetlands, traditional plant potential, biodiversity, and wetland-reliant species at risk and migratory birds. The Panel also concluded that the Project, in combination with other existing, approved, and planned projects is likely to result in significant adverse cumulative effects to wetlands, old-growth forests, traditional plant potential, biodiversity, and wetland and old-growth-reliant migratory birds and species at risk, including caribou. However, the Panel concluded that the Project, alone and in combination with other projects, was not likely to result in significant adverse Project or cumulative effects to aquatic resources given the mitigation proposed by Shell.

[1610] The Panel also notes the concerns of the NSFMFM and Clearwater Band about the effects of the Project on air and water quality and the potential contamination of traditional resources. The Panel concluded that the Project, alone and in combination with other existing, approved, and planned projects was not likely to result in significant adverse effects to air quality or human health. The Panel notes that in its EIA, Shell considered the effects of Project, alone and in combination with other existing and approved projects on a range of surface water quality parameters including temperature, DO, and sediment quality and concluded that the effects would be negligible. Shell predicted that muskeg and overburden drainage from the Project would not have a significant affect on DO levels or temperature in receiving streams. The Panel concluded that with the implementation of Shell's proposed mitigation measures and commitments, the work being developed on the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* by federal and provincial governments, and the Panel's expectations and recommendations, it is unlikely that significant adverse environmental effects would occur to surface water quality or aquatic health in the Muskeg River, Athabasca River or the PAD.

[1611] Based on the evidence presented by the NSFMFM and Clearwater Band, the Panel recognizes that the Project may result in some impacts to the TLU activities of certain NSFMFM and Clearwater Band members. However, based on the limited information on current TLU provided, the Panel does not believe that the Project will have a widespread or significant effect on the TLU activities of NSFMFM and Clearwater Band members. Similarly, the Panel does not believe that the Project will have a significant adverse effect on any unique cultural sites or resources important to NSFMFM and Clearwater Band members.

[1612] The Panel has concluded however that the Project, in combination with other existing, approved, and planned projects and activities is likely to result in significant adverse cumulative effects to several terrestrial resources important to TLU activities and, therefore, the Project is also likely to result in significant adverse cumulative effects to TLU activities and Aboriginal and treaty rights. The Panel believes it is reasonable to conclude that NSFMFM and Clearwater Band members who practice TLU activities may also experience significant adverse cumulative effects to these activities. However, the Panel found that the NSFMFM and Clearwater Band provided only very general information (such as avoidance of some areas or resources) on how these perceived cumulative effects were affecting the traditional use activities of their members. For this reason, the Panel is not able to conclude that these regional cumulative effects are having a significant adverse effect on the TLU of the NSFMFM and Clearwater Band members. At the same time, the Panel understands that the inability of the NSFMFM and Clearwater Band members to clearly demonstrate where and how they practice their TLU activities and how they may be affected by the cumulative effects of development in the region may be due at least in part, due to a lack of capacity to compile such information.

[1613] Furthermore, the Panel believes that ensuring there is a range of housing options in the community that meets the needs of residents with differing income levels is a shared responsibility between the various levels of government. The role of industry is to provide the taxes and royalties though which governments can discharge their obligations, to assist in the necessary planning, and to mitigate the impacts of its projects.

Fort McMurray #468 First Nation (FMMFN #468)

Evidence

Participation and Requested Disposition

[1614] FMMFN #468's participation in the review process and hearing is discussed in the Participant Involvement in the Review Process section.

[1615] Shell noted that it could not test FMMFM #468's evidence because FMMFM #468 did not sit a witness panel. Shell also questioned why FMMFN #468 did not sit a witness panel while the hearing was in Fort McMurray suggesting that it would not have required much effort.

[1616] In final argument, FMMFN #468 stated that it did not seat a witness panel due to the costs of doing so and that it had done what it could with its very limited resources to assert its rights. FMMFN #468 acknowledged that its evidence was untested but argued that the Panel should still give it some weight. FMMFN #468 submitted that even though the evidence in its recently completed TLU study was untested, there are elements of it that were still reliable. FMMFN #468 argued that it was Shell's and the Panel's obligation to consider the impacts to those rights.

[1617] FMMFN#468 made several recommendations to the Panel. A list of these recommendations is provided in Appendix 8.

Rights Being Asserted

[1618] FMMFN #468 asserted that the community that is today known as FMMFN #468 traces its origins back to the Cree-Chipewyan Band of Fort McMurray that originally signed Treaty 8 on August 4, 1899. FMMFN #468 indicated that FMMFN #468 and the Fort McKay First Nation were originally part of the same band until 1942. FMMFN #468 stated that the family groups that were to become and remain part of FMMFN #468 were people living along the Clearwater River, families staying around Willow Lake (now known as Gregoire Lake; also known as the area around Anzac), and a family group around Cheecham Lake.

[1619] FMMFN #468 stated that its current reserve locations reflected its diverse heritage and history on the land. The Clearwater Reserve (#175) is located at the forks of the Christina and Clearwater Rivers and is also known as the Paul Cree Band Reserve. Three other reserves were established – reserves 176, 176a, and 176b, on the south and northeast shores of Willow Lake near Anzac. FMMFN #468 stated that a fifth reserve, called the Alexis Reserve, located along the Clearwater River due east of Gordon Lake, is known to FMMFN #468 but does not appear to have been included in the government's records.

[1620] FMMFN #468 asserted that its traditional territory constituted a large area in northern Alberta that included the areas where Shell intended to construct and operate the Project. FMMFN #468 asserted that it has Aboriginal and treaty rights in the area affected by the Project and that its livelihood rights, including the right to traditional hunting, fishing, trapping, and gathering, as well as the right to access traditional territories and the right to environmental quality sufficient to sustain its traditional livelihood, are protected by s.35(1) of the *Constitution Act*, the Natural Resources Transfer Agreement and Treaty 8.

Adequacy of Consultation - by Shell

[1621] FMMFN #468 expressed concern that the EIA for the Project completely lacked information with respect to the effect that the Project will have on FMMFN #468. FMMFN #468 stated that the EIA did not delineate its traditional territory and harvesting uses, discuss potential impacts of the Project on its traditional uses, or propose any mitigation with respect to specific impacts on it.

[1622] FMMFN #468 stated that the lack of information regarding the effect the Project would have on it stemmed from a lack of consultation by Shell. Furthermore, FMMFN #468 believed that Shell based its approach to consultation on a cursory review of the publicly available report, *Nistawayaw, Where Three Rivers Meet, Fort McMurray #468 First Nation, Traditional Land Use Study* (2006) (the "2006 Report") and that Shell had incorrectly interpreted and applied the contents of the report.

[1623] Shell stated that it determined its approach to consultation with different groups by the possibility of Project impacts on those groups. Shell confirmed that it had reviewed *The 2006 Report* and that this was a factor in its assessment of the potential for project effects on FMMFN #468. Shell noted that the report, prepared by FMMFN #468, was one of the few reports available on FMMFN #468 TLU activities at the time. Based on its review of the report, Shell observed that the Project was located in the extreme northern part of FMMFN #468's traditional territory and believed that there was little potential for the Project to adversely affect the TLU activities of FMMFN #468 and its members. Notwithstanding its belief that the Project would not have any significant effects on FMMFN #468, Shell stated that it informed FMMFN #468 that if it had any more specific information about TLU activities in the project area, it could provide this information to Shell. Shell stated that until quite recently, it had not received any further information and that it was the little evidence of direct use of the Project area that was available that guided Shell's approach to consultation with FMMFN #468.

[1624] FMMFN #468 stated that it produced *The 2006 Report* in the context of another project further south and that Shell should not have used it to evaluate the extent of FMMFN #468 land use in the Project area. FMMFN #468 explained that it provided *The 2006 Report* to Shell as a preliminary document in order to request funding from Shell for a project-specific TLU study.

[1625] FMMFN #468 also expressed concern that Shell had not provided it with funding for a third-party technical review of the application materials for the Project, despite FMMFN #468 identifying this as a need in its October 2008 Statement of Concern about the Project. FMMFN #468 indicated that it had limited internal capacity to review and understand detailed technical materials and that it required funding for such a review to allow it to better understand the potential impacts of the Project on its TLU activities and Aboriginal and treaty rights. FMMFN #468 said that Shell's failure to provide it with capacity funding represented a low water mark for Aboriginal groups.

[1626] Shell confirmed that it did not fund any technical review studies for FMMFN #468 because it did not believe that there was potential for the Project to affect the exercise of FMMFN #468's Aboriginal and treaty rights. Shell did note however that FMMFN #468 had received $ 77 000 in funding from CEAA for participation in the review of the Project and the PRM.

[1627] Shell stated that it contributed to FMMFN #468's 2006 TLU study and has pursued consultation with FMMFN #468 since 2007 in order to better inform its assessment of impacts. Shell indicated that it had reviewed other information including the maps received from FMMFN #468 in 2011 but that this data did not show any significant TLU activity in the Project area.

Adequacy of Consultation - by the Crown

[1628] In its October 1, 2012 NQCL, FMMFN #468 asserted that the Crown had not adequately consulted with or accommodated FMMFN #468 with respect to the potential impacts of the Project on its members' harvesting rights or practices in the following ways.

a) Shell and the Crown did not adequately consider FMMFN #468's traditional knowledge or fully identify the scope of FMMFN #468 harvesting rights and culturally important species in the Project area.

b) Shell and the Crown failed to adequately identify impacts caused by the Project on FMMFN #468's culturally important wildlife species and plants in the Project area and impacts on FMMFN harvesting rights.

c) The Crown failed to adequately consult with FMMFN #468 with respect to impacts caused by the Project on culturally important wildlife species and plants in the Project area and in FMMFN #468's traditional territory, or consult with respect to impacts on FMMFN harvesting rights in those areas.

d) The Crown failed to adequately consult with the FMMFN with respect to overall and cumulative impacts of the Project and other projects in FMMFN #468's traditional territory.

e) Shell and the Crown did not modify the development of the Project or otherwise eliminate, mitigate or accommodate impacts on traditional harvesting rights of FMMFN #468 in the Project area.

[1629] In its NQCL, FMMFN #468 asserted that the Crown had a legally enforceable duty to consult with and accommodate FMMFN #468 where existing and claimed rights under Treaty 8 and Aboriginal rights may be affected, including the rights to hunt, gather, trap, and fish. FMMFN #468 asserted that the actions of the Crown would have a significant impact on the ability of the FMMFN #468's members to continue to exercise their constitutionally protected harvesting rights and that any decision by the Crown that interferes with the method, timing, or extent of FMMFN #468's harvesting rights constitutes a prima facie infringement of such rights and may violate section 35 of the *Constitution Act*, 1982. FMMFN #468 asserted that if the Crown approves the Project, this will likely result in a large scale destruction of the Project area thereby significantly interfering with the FMMFN #468's right to harvest in its traditional territories. In these circumstances, the decision of the Crown must be justified in accordance with the principles enunciated in *R. v. Sparrow*, [1990] 1 S.C.R. 1075.

Effects on Traditional Land Use, Rights, and Culture

[1630] FMMFN #468 raised several concerns about the methodology Shell used to complete the EIA. FMMFN #468 argued that the selection and use of the LSA was inappropriate given the size of the Project footprint. FMMFN #468 stated that Shell should have used a larger LSA and that the significance of project effects should also have been considered at the LSA level. FMMFN #468 also argued that the RSA was too large as it was originally established to encompass two projects and was therefore inappropriate for one project. FMMFN #468 noted that the RSA for the Project was twice as large as that used for the Kearl project even though the Kearl project was bigger, in terms of the volume of bitumen produced.

[1631] FMMFN #468 argued that Shell had failed to appropriately consider ecological context when assessing effects to both terrestrial resources and Aboriginal and treaty rights. FMMFN #468 stated that ecological context is required in the consideration of the size of the footprint and the amount of other disturbance in the area. FMMFN #468 noted that there were already many active mines in the Project area and that these mines were already limiting access to areas previously used for TLU practices. FMMFN #468 stated that the appropriate ecological context for the Project was one of heavy industrial development. It also said that Aboriginal use of the area was "fragile" due to this development and Shell did not discuss this in a significant way in the EIA.

[1632] FMMFN #468 stated that the Panel should consider the effects of the Project before reclamation because reclamation will not occur for a long time and the results of reclamation are uncertain.

[1633] Shell stated that FMMFN #468 did not provide evidence of significant use in the Project area and as a result, Shell did not believe that there was a potential for the Project to affect the TLU of FMMFN #468 members.

[1634] FMMFN #468 stated that its members practiced TLU activities and Aboriginal rights very close to, if not within, the LSA and RSA. FMMFN #468 argued that contrary to Shell's predictions, the Project will result in significant adverse effects to current traditional use and Aboriginal rights in both the LSA and RSA. FMMFN #468 stated that traditional use is an evolving issue. Land use changes over time as resources change and as some areas become unavailable, for example due to mining, other areas are used.

[1635] FMMFN #468 submitted a report on TLU and activities entitled *Cumulative Impacts to FMMFN #468 Traditional Lands and Lifeways* (*TLL Report*). The report is a compilation and analysis of previous studies and work related to FMMFN #468 TLU, completed in September 2012. According to FMMFN #468, the *TLL Report* describes some of its land use in a regional disturbance study area (RDSA) and in a smaller focused disturbance study area (FDSA). The FDSA was centered on the confluence of the Steepbank and Athabasca Rivers and extended 150 km from west to east and 215 km from south to north. The FDSA includes an area close to FMMFN #468's reserves near Gregoire Lake, along the Clearwater River and downstream along the Athabasca River. The southernmost extension of the FDSA is located 40 km south of the FMMFN #468's reserve at Gregoire Lake and extends north to Poplar Point on the Athabasca River. FMMFN #468 described the RDSA as based on a broad generalization of FMMFN #468 traditional lands extending from the North Saskatchewan River in the south to the Firebag River to the north.

[1636] FMMFN #468 stated that wildlife and plant populations were an important part of the First Nation's culture and traditional economy and that Phase 1 had negatively affected and will negatively affect culturally important wildlife and plant populations and the ability of the FMMFN #468 members to conduct traditional harvesting activities in the Project area.

[1637] FMMFN #468 provided sworn affidavits from two FMMFN #468 members who reported that they had regularly practiced and continue to regularly practice TLU activities on and in the vicinity of the Project footprint, including hunting, fishing, and gathering. Species reported to have been hunted in the area included birds (including but not limited to grouse), moose, wolves, buffalo, caribou, lynx, fox, beaver, muskrat, squirrel, weasel, and otter. The members reported fishing for whitefish, pickerel, jackfish, and suckers. The members reported gathering blueberries, high bush cranberries, low bush cranberries, Saskatoon berries, raspberries, gooseberries, chokecherries, and traditional medicines, including but not limited to roots, sweetgrass, and bark. In their affidavits, the two members expressed concern that the construction and operation of the Project would further affect wildlife populations in the area and that the Project would occupy lands to which they previously had a right of access. The members also expressed concern that ongoing development adjacent to the Project area would affect their ability to harvest plants and wildlife and would further restrict the area in which they can exercise their treaty rights to hunt, fish, trap, and gather.

[1638] The *TLU Report* identified the following specific FMMFN #468 uses in the general Project area:

- Two cabins 20 to 30 kilometres south of the JPME area
- One site of cultural importance south of Fort McKay
- Big game harvesting sites north and west of McClelland Lake, north of the Project area and near the PRM footprint
- Bird harvesting sites between Kearl and McClelland Lakes, close to the Project and alongside the Athabasca River and the PRM project.

[1639] FMMFN #468 submitted some of the preliminary TLU maps developed for the *TLU Report* to Shell and the Panel in late 2011. FMMFN #468 said that the affidavits, *The 2006 Report*, and *TLU Report* represented only a limited selection of the traditional use that has occurred and continues to occur in the Project area. FMMFN #468 expressed concern that even though the TLU information and affidavits provided by it demonstrated use in the Project area, Shell did not consider this use to be significant.

[1640] FMMFN #468 said that the Project will make some land unavailable for traditional use and restrict access to other areas.

[1641] Shell stated that all of the rights holders will be escorted across its lease in order to access their traditional lands.

[1642] Shell stated that based on the information that it received to date from FMMFN #468, there was little evidence of FMMFN #468 use in the Project area and as a consequence, there was no potential for the Project to significantly affect the TLU of FMMFN #468.

[1643] FMMFN #468 stated that existing cumulative impacts on the exercise of Aboriginal and treaty rights were already significant. It believed that its members were being increasingly alienated from the use of their traditional lands and food due to the removal of traditional areas by oil and gas development, forestry, municipal expansion, competing recreational uses, access barriers, protected areas, and government game and firearm regulations.

[1644] The *TLL Report* identified the concerns of FMMFN #468 members related to the encroachment of oil sands development on their traditional territory and the associated cumulative effects. Specific concerns included the cumulative effects of oil sands and other activities on air quality, water quantity and quality, the quality of traditional foods, and changes in animals. FMMFN #468 also raised concerns about changes in recreational use of the land resulting from increased access and population growth and changes in government regulations that have affected TLU activities. In the report, some FMMFN #468 members described the associated cumulative effects as "overwhelming".

[1645] The information and analysis in the *TLL Report* was based on an RDSA that represented the area of TLU by the FMMFN #468. The RDSA included the Project area and extended south to the North Saskatchewan River. The report stated that this RDSA was selected and used in order to assess cumulative disturbance from projects that were already in existence as of 2006. Based on the analysis conducted, the report concluded that the traditional territory of the FMMFN #468 was already significantly disturbed and fragmented in 2006.

[1646] FMMFN #468 members noted declines in abundance of both moose and migratory birds. FMMFN #468 members reported that the moose population was now one quarter or one half of what it was 20 years ago and attributed this decline to the development of the oil industry. They also reported a decline in the number of migratory birds in the Willow Lake area. In the *TLL Report*, FMMFN #468 members reported changes that they have observed in several fish and animals such as meat discoloration, changes in the taste of moose meat, tumours, and abnormal looking organs. FMMFN #468 members also reported behavioural changes in some animals.

[1647] FMMFN #468 members indicated that berries were not as abundant as they once were because of the cumulative effects of industrial development.

[1648] Several FMMFN #468 members stated that they have to travel further to obtain safe and clean traditional resources. Some FMMFN #468 members reported that they stopped eating traditional food gathered in the vicinity of their community about 10 years ago because of the fear of contamination.

[1649] FMMFN #468 members reported that since the 1970s, the colour and taste of water from the Clearwater River and from several lakes has changed and they consider that Gregoire Lake is no longer a safe source of drinking water. FMMFN #468 members stated that they believe that they have lost their supply of drinkable surface water because of fear of contamination and that this loss has detrimental affects on their land use.

[1650] FMMFN #468 members stated that they noticed a decline in air quality approximately 10 years ago and believed that the poor air quality contributes to water contamination.

[1651] FMMFN #468 members reported that the water flow in the Athabasca River was less than the minimum required to support the exercise of their treaty and Aboriginal rights.

[1652] FMMFN #468 noted that Shell did not perform an analysis of the economic impacts of delaying the Project for a period of time. FMMFN #468 argued that in order to prevent significant adverse environmental effects to terrestrial resources and TLU, the Panel should recommend that the Project be delayed for a period of 10 years. FMMFN #468 argued that there would be environmental benefits from delaying the Project given the pace of development of the oil sands industry. FMMFN #468 also said that current economic conditions justify such a delay.

[1653] FMMFN #468 stated that if the Project is approved, any approval should include a condition requiring Shell to consult with FMMFN #468 and conduct a project-specific traditional use study. FMMFN #468 argued that it produced *The 2006 Report* in the context of another project further south and the report was not an accurate description of FMMFN #468's TLU in the Project area.

Analysis and Findings

Participation

[1654] The Panel notes that FMMFN #468 did not sit a witness panel to speak to its evidence, and therefore, their evidence could not be tested through questioning by Shell or the Panel. Although the Panel has made some use of FMMFN #468's evidence to determine the potential for the Project to affect FMMFN #468's TLU and Aboriginal and treaty rights, the Panel finds that it is not able to give the evidence much weight. This is particularly true for FMMFN #468's evidence regarding its current use of lands and resources in the vicinity of the Project.

[1655] The Panel recognizes that FMMFN #468 has limited resources with which to participate in proceedings such as the hearing for the Project but believes it is unfortunate that the two individuals who provided affidavits related to their traditional use activities in the vicinity of the Project or other FMMFN #468 members were not presented as witnesses during the hearing. The Panel believes that this would not have significantly increased the cost of FMMFN #468's participation in the hearing, and may have provided the Panel with additional information on FMMFN #468's use of the Project area.

Rights Being Asserted

[1656] The Agreement requires the Panel to consider the effects of the Project on asserted or established Aboriginal and treaty rights, to the extent the Panel receives such information. The Panel has not made any determinations as to the validity of the Aboriginal or treaty rights being asserted by ACFN or the strength of such claims but for the purposes of assessing the potential effects of the Project on FMMFN #468's Aboriginal and treaty rights, the Panel accepts that FMMFN #468 has the rights being asserted.

Consultation

[1657] The Panel accepts Shell's view that the degree of consultation required by project proponents should be guided by the potential for a project to result in adverse effects to a particular individual or group, including First Nations and other Aboriginal groups.

[1658] Based on the evidence provided by FMMFN #468 about the TLU activities of its members, the Panel believes that Shell's approach to consultation with FMMFN #468 was appropriate. The evidence does not support the claim that the Project area is used in a significant way by FMMFN #468 members for the practice of TLU or Aboriginal and treaty rights. The Panel, therefore, believes that it was reasonable for Shell to conclude that the Project would not likely have a significant effect on the traditional use or Aboriginal and treaty rights of FMMFN #468 and to tailor its consultation efforts with FMMFN #468 accordingly. The Panel notes that Shell told FMMFN #468 that if it had additional information about the use of the Project area by its members, it could provide this information to Shell. The Panel believes that this invited FMMFN #468 to provide additional information to support its request for additional consultation.

[1659] While FMMFN #468 did subsequently provide affidavits from two individuals who appear to continue to use the Project area for traditional purposes, the Panel notes that it did not provide these affidavits until late 2011, more than four years after the EIA process and associated consultation for the Project was initiated. Similarly, preliminary maps prepared by FMMFN #468 were not available until late 2011 and the final TLU report was not completed until 2012.

[1660] The Panel believes that Shell made reasonable efforts to consult with FMMFN #468 in order to understand its TLU activities in the area and that there were numerous opportunities for FMMFN #468 to makes their concerns known to Shell and to provide information.

[1661] The Panel acknowledges that FMMFN #468 has limited capacity to complete a detailed technical review of the application materials and that Shell did not provide funding for such a technical review. While the Panel understands that this may have made it more difficult for FMMFN #468 to assess the potential for the Project to effects to their TLU and Aboriginal and treaty rights, the Panel does not believe the absence of specialized resources to conduct technical reviews precluded FMMFN #468 from identifying potential impacts to its TLU or rights.

Effects on Traditional Land Use, Aboriginal Rights, and Culture

[1662] The Panel agrees with FMMFN #468's observations made about the size of the LSA and RSA used by Shell for the assessment of project effects, the need to determine significance at the LSA as well as RSA levels, and the manner in which Shell considered ecological context in the EIA. The Panel also notes that Shell did not provide an assessment of the effects of the Project on the TLU and culture of each First Nation or Aboriginal group as requested by the Panel. For this reason, the Panel has not relied on the significance determinations provided by Shell in the EIA and has made its own significance determinations based on a consideration of these issues and the evidence provided by all parties.

[1663] For the purposes of assessing the potential impacts of the Project on TLU, Aboriginal and treaty rights, and culture of FMMFN #468, the Panel notes that the Project is located within an area that FMMFN #468 has identified as its traditional territory. The Panel also accepts that members of FMMFN #468 have practiced and may continue to practice TLU activities, their Aboriginal and treaty rights, and culture within the traditional territory identified.

[1664] The Panel notes, however, that the Project is proposed to be located near the northern extent of the traditional territory identified by FMMFN #468 and that the evidence of TLU activity by FMMFN #468 members in the immediate area of the Project is quite limited. The majority of traditional use reported in the *TLU Report* occurs some distance to the south of the Project, particularly to the east and north-east of Fort McMurray and in the vicinity of the

Clearwater River and Gregoire Lake. Although FMMFN #468 reported some traditional use activities further north, it reported limited use within or immediately adjacent to the Project footprint. Most of the use that is reported in the vicinity of the Project occurs west of the Project area along the Athabasca River and north and west of McClelland Lake in areas which are not expected to be directly affected by the Project. The Panel also notes that the authors of the report did not appear at the hearing so the evidence in the report could not be tested by Shell or the Panel.

[1665] The Panel notes the affidavits of two FMMFN #468 members reporting that they have conducted and continue to conduct TLU activities and exercise their Aboriginal and treaty rights within or very close to the Project footprint. The Panel also notes that the two FMMFN #468 members who provided affidavits did not appear as witnesses at the hearing and consequently their evidence could not be tested by Shell or the Panel. Although the affidavits suggest some FMMFN #468 members may have exercised or continue to exercise their Aboriginal and treaty rights in the Project area, the Panel is not able to give any real weight to this untested evidence where it is at odds with other evidence that was able to be tested in the hearing. Additionally, FMMFN #468 did not provide any other community witnesses to support FMMFN #468's claim that the Project area has been and continues to be an important area for the exercise of FMMFN #468's TLU, Aboriginal and treaty rights, and culture.

[1666] Therefore, while the Panel acknowledges that some FMMFN #468 members may continue to use the Project area for the exercise of their Aboriginal and treaty rights and that these activities could potentially be effected by the Project, FMMFN #468 did not provide sufficient evidence to demonstrate significant and ongoing traditional use of the Project area by FMMFN #468 members. The Panel therefore finds that the Project is unlikely to have a significant adverse effect on the TLU or Aboriginal and treaty rights of FMMFN #468.

[1667] The Panel notes that the *TLL Report* includes an assessment of cumulative effects for both the RSDA and FDSA areas. However, the Panel notes that the RSDA and FDSA areas are not directly comparable to the RSAs used by Shell as they include a significant area south of Fort McMurray. Additionally, as FMMFN #468 did not present the authors of the report as witnesses, neither Shell nor the Panel was able to ask questions about the study's methodology or results. As a result, the Panel was not able to place much weight on the evidence in the *TLL Report*.

[1668] The Panel's own assessment identifies potential significant adverse cumulative effects on wetlands, old-growth forest, traditional plant potential, biodiversity, wetland-reliant species at risk and migratory birds, old-growth forest-reliant species at risk and migratory birds, including caribou as well as to TLU in the broader area surrounding the Project. Although there is limited evidence of use by FMMFN #468 in the Project area or in its immediate vicinity, there is some evidence in the *TLL Report* of historic use in the larger RSAs as defined by Shell, particularly south of the Project and east of Fort McMurray. Consequently, the Panel cannot rule out the possibility of significant adverse cumulative effects on the traditional use by FMMFN #468 arising from the Project, in combination with past, present, and future projects. However, FMMFN #468 did not present any witnesses to substantiate that there are current TLU activities occurring in the areas that would be subject to such cumulative effects. The Panel therefore finds that there is insufficient evidence for the Panel to conclude that the cumulative effects associated with the Project would have an adverse effect on FMMFN #468's TLU activities or Aboriginal or treaty rights.

Fort McKay First Nation and Fort McKay Métis Community Association

Evidence

Participation and Requested Disposition

[1669] Fort McKay's participation in the review process and hearing is discussed in the Section Participant Involvement in the Review Process.

[1670] FMFN and FMMCA withdrew their objections to the Project shortly before the hearing but remained concerned about the cumulative impacts of regional development and the lack of consultation and accommodation by Alberta and Canada with respect to these impacts on their lands and Aboriginal and treaty rights.

[1671] Fort McKay did not object to approval of the Project but made several recommendations to the Panel related to the management of cumulative effects and Crown consultation. A list of these recommendations is included in Appendix 8.

Rights Being Asserted

[1672] Fort McKay made its October 1, 2012 submission on behalf of FMFN and the FMMCA, collectively referred to as Fort McKay. It described the community of Fort McKay as consisting of approximately 800 Cree, Dene, and Métis residents who have for generations been self governing and practicing hunting, fishing, and trapping in their traditional territory. Fort McKay stated that the FMFN has approximately 650 registered members and the FMMCA has approximately 63 members that are residents of Fort McKay. The submission provided a description of Fort McKay's rights and interests, often without distinguishing between the rights of FMFN and FMMCA.

[1673] Fort McKay asserted that its people have, as Canadians, statutory and common law rights. Fort McKay also asserted that, in addition, it has constitutional communal and individual rights as part of the first peoples of Canada.

[1674] Fort McKay stated that its people are Indians within the meaning of the *Indian Act*, beneficiaries of Treaty 8, and Aboriginal people within the meaning of the *Constitution Act*, 1982.

[1675] Fort McKay explained that the text of Treaty 8 and the oral assurances made on behalf of the Crown at the time the Treaty was negotiated include the right to hunt, trap, and harvest natural resources within its traditional territory and guarantees the protection of its way of life, use, enjoyment, and control of lands reserved and the right to a livelihood.

[1676] Fort McKay asserted that it has the right to self-government and to have its culture and religion protected. Fort McKay also asserted that it has the right to harvest a variety of resources, including the right to hunt for food in all seasons pursuant to the *Natural Resources Transfer Agreement*.

[1677] Fort McKay asserted that the Métis also have Aboriginal rights, including the right to hunt and the right to harvest natural resources in their traditional territory.

[1678] Fort McKay stated that Alberta has the ability to take up lands for mining and other purposes pursuant to Treaty 8 but Fort McKay believes that this right is limited by Fort McKay's right to lands of a quality and nature sufficient to support the meaningful exercise of treaty rights and access to those lands.

[1679] Fort McKay stated that the provincial and federal Crowns have a duty to not restrict treaty and Aboriginal rights and to justify any infringement by demonstrating:

- compelling and valid legislative objective;
- that priority was given to the rights;
- the means of achieving the objective infringed the right, (including the preferred means of exercising it), as little as possible;
- the First Nation was consulted; and
- that necessary compensation was paid.

[1680] Fort McKay stated that it had the right to be consulted and accommodated with respect to potential adverse effects on its rights and the interests secured by these rights.

[1681] Fort McKay stated that the FMFN owned fee simple lands and the use and benefit of Reserves 174, 174C, 174D, 174B, and 174A. The reserve lands comprised 26 000 ha, making FMFN the largest land holder in the northern portion of the Lower Athabasca Region after the provincial government and Wood Buffalo National Park. Fort McKay asserted that it had the right to use and enjoy reserve lands pursuant to section 18(1) of the *Indian Act* (R.S. 1985, C. I–5) with a corresponding fiduciary obligation on Canada to protect these land rights and their value to it.

[1682] Fort McKay stated that the Métis held about 800 acres in Fort McKay pursuant to a long-term lease with the Government of Alberta and asserted the right to use and enjoy the lands it occupied in the community free from noxious odours, pollution, noise, and other nuisances.

[1683] Fort McKay stated that community members held 30 traplines within its traditional territory totalling 935 146 ha. Approximately 80 per cent of this land has been leased for oil sands development.

[1684] Fort McKay asserted the right to commercial fur harvesting for holders of RFMAs pursuant to the Wildlife Regulation, Alta Reg. 143/1997. Fort McKay further asserted the statutory right to hunt, fish, and trap on Crown lands pursuant to the *Hunting, Fishing and Trapping Heritage Act* (S.A. c. H-15.5).

Adequacy of Consultation by Shell

[1685] Fort McKay did not raise any concerns about the adequacy of Shell's consultation.

Adequacy of Consultation by the Crown

[1686] Fort McKay stated that it had not been consulted by Alberta and Canada on the cumulative impact of oil sands development or the wholesale taking up of lands within its traditional territory. As a result, Fort McKay's opportunities to exercise its treaty and Aboriginal rights continue to be increasingly restricted and lost.

[1687] Fort McKay stated that although each project adds to the cumulative loss of TLU opportunities and adversely affects the community of Fort McKay and its rights, neither Canada nor Alberta have a process for consulting on the overall impacts of intensive oil sands development. Fort McKay also stated that neither government will consider or address options for accommodating the significant loss of Fort McKay's traditional lands and resources necessary to support TLU opportunities.

[1688] Fort McKay stated that Alberta and Canada continue to take the position that adverse effects to Aboriginal and treaty rights can be addressed using a project-by-project approach. Fort McKay stated that rather than engaging in consultation, Canada's approach was to encourage Fort McKay to participate in the JRP hearing process so that its concerns would be incorporated into the Panel's decision report and would then be considered by Canada. Fort McKay said Alberta delegates consultation to project proponents who do not have the power or authority to accommodate Aboriginal or treaty rights, or the constitutional obligation to do so.

[1689] Fort McKay stated that because each project, considered in isolation, removes a relatively small portion of Fort McKay's traditional territory, the Crown does not consider whether some protection and accommodation is required or assumes none is required. Fort McKay further stated that as a result of the Crown's approach, a large number of projects have been approved, impacts have increased dramatically, and its rights have been eroded to the point of infringement. Fort McKay stated that the experience of the community, and the scientific assessments it had commissioned, confirm these impacts. Fort McKay also stated that the modelling work commissioned by the Government of Alberta and Fort McKay, the wildlife surveys Fort McKay sponsored, and other data all indicate that as a result of bitumen production, the land and resources within Fort McKay's traditional territory will likely not support TLU activity.

[1690] Fort McKay stated that the *LARP* will not change this situation because it is a plan to maximize bitumen production. Fort McKay stated that the protected areas under the plan are not, for the most part, located within Fort McKay's traditional territory and there is no evidence that they are sufficient to support wildlife populations and other terrestrial resources in the region. Fort McKay stated that the protected areas were not selected based on an assessment of their impact on the projected decline of environmental indicators. Fort McKay submitted that the protected areas and existing management frameworks will not prevent mining or other development of 80 per cent of Fort McKay's traditional territory, as currently projected and optimized by government policy.

[1691] Fort McKay stated that before further oil sands development, accommodation in the form of environmental, land management, and economic benefits are essential because mining and bitumen processing is destroying large tracts of land and transforming the landscape, way of life, culture, and environment of Fort McKay, thus infringing on its rights. Fort McKay further stated that the cumulative effects of this large scale industrial development on Fort McKay cannot be mitigated by incremental change to individual mine operations.

[1692] Fort McKay requested that the Panel recommend to Canada and Alberta that they appoint negotiators with the necessary mandate to negotiate accommodation measures with Fort McKay, including:

- the management of designated areas for the objective of maintaining TLU in reasonably close proximity to Fort McKay;
- establishment of a protective buffer zone around Fort McKay's community and reserves on the west side of the Athabasca River;
- consultation, and coordination of land use planning and development near the borders of Fort McKay's reserves and the community aimed at maintaining Fort McKay's land use on its reserves; and
- collaborative arrangements for the management of Fort McKay's traditional territory and its resources, including partnering in environmental monitoring and development of management strategies.

Cumulative Effects on Traditional Land Use, Rights and Culture

[1693] Fort McKay stated that it is the community most affected by current industrial development in the Lower Athabasca Region as the mineable oil sands area and portions of the in-situ oil sands areas are located in the heart of Fort McKay's traditional territory. Fort McKay stated that the following oil sands projects are located within a 20-km radius of the community: MRM, Phase 1, the CNRL Horizon Mine, the FHEC FHOSP, Suncor's McKay River SAGD, portions of Suncor's Steepbank, Millennium and Voyageur projects, the Syncrude Aurora North Mine, Syncrude Mildred Lake, and the Total Josyln North Mine. Fort McKay noted that approximately 75 per cent of its traditional territory is covered by oil sands leases and that there are a significant number of new in-situ projects for which approval is being sought within its traditional territory.

[1694] Shell submitted the *Fort McKay First Nation Traditional Knowledge Report* that contains information gathered during meetings and interviews with members of the FMFN. This report describes an LSA based on Shell's lease areas and an RSA based on Fort McKay's TLU and occupancy study from 1994, *There is Still Survival Out There*.

[1695] Shell also provided funding for and submitted the *Fort McKay Specific Assessment* (*FMSA*) on behalf of the Fort McKay IRC. The *FMSA* stated that Fort McKay, Shell, and the Governments of Alberta and Canada agreed to conduct a *FMSA* as a pilot project in relation to the Project and PRM applications, in order to provide (from Fort McKay's perspective) appropriate and sufficient information that:

- Fort McKay can use to more fully understand and assess the effects of Shell's projects and cumulative oil sands developments on environmental, cultural, and traditional resources of concern and interest to Fort McKay, as well as on Fort McKay's cultural heritage;
- is specific to Fort McKay and that the regulators must consider when making public interest decisions regarding the projects; and
- provides information and recommendations to assist, Alberta, Canada, Shell, and Fort McKay to develop mitigation and accommodation strategies that address any potential adverse effects and to inform consultation.

[1696] The *FMSA* depicts FMFN's traditional territory as consisting of an area extending north to the Wood Buffalo National Park boundary, south to include Fort McMurray, east to the

Alberta-Saskatchewan border, and west to the Birch Mountains. The *FMSA* states that in addition to the traditional territory of FMFN, it used two other study areas to assess the effects of the Project: one based on Fort McKay's CSEs, and another one that took into account development effects in proximity to the community and provided an appropriate scale for the assessment of effects on terrestrial resources. The *FMSA* depicted the latter as the Forty Township Study Area (FTSA). The FTSA straddled the Athabasca River and extended from the confluence of the Steepbank and Athabasca Rivers in the south to the confluence of the Firebag and Athabasca Rivers in the north (Townships 93 to 100), and from range 8 to 12 W5M. The FTSA encompassed the hamlet of Fort McKay and Shell's LSA for the Project. The *FMSA* stated that for the assessment, it used the FTSA as an RSA and the same LSA as the one used by Shell. The *FMSA* stated that the FTSA encompassed many areas of high value and use by Fort McKay.

[1697] The *FMSA* used the same base case, application case, and PDC that Shell used in its 2007 EIA and included the PRM in the application case. The *FMSA* also included a predevelopment scenario and a current scenario that were not included in Shell's 2007 EIA.

[1698] The *FMSA* found that the total area of anthropogenic disturbance was

- 166 097 ha in the base case, 5 per cent of Fort McKay's total traditional territory of 3 525 101 ha;
- 188 893 ha in the application case, 5 per cent of Fort McKay's traditional territory; and
- 316 303 ha in the PDC, 9 per cent of Fort McKay's traditional territory.

[1699] The *FMSA* found that:

- for the all-traditional-use CSE, areas of moderate and intense use were 11 and 16 per cent disturbed, respectively, in the base case. This increased to 13 and 16 per cent disturbed, respectively in the application case and 19 and 21 per cent disturbed, respectively in the PDC;
- for the large-game-harvesting CSE, areas of moderate and intense use were 1 and 14 per cent disturbed, respectively in the base case. This increased to 1 and 16 per cent disturbed, respectively in the application case and 4 and 22 per cent disturbed, respectively in the PDC; and
- for the traditional-plant-harvesting CSE, areas of moderate and intense use were 21 and 39 per cent disturbed, respectively in the base case. This increased to 24 and 39 per cent disturbed, respectively in the application case and 30 and 50 per cent disturbed, respectively in the PDC.

[1700] The *FMSA* stated that due to the high overlap between industrial development and the moderate and high use areas for all categories of CSEs, Fort McKay considered the losses associated with the base case, application case, and PDC to be adverse and significant.

[1701] The *FMSA* found that within the smaller FTSA, the total amount of anthropogenic disturbance was:

- 31 and 19 per cent for the moderate and intense use areas, respectively in the base case;

- 40 and 20 per cent for the moderate and intense use areas, respectively in the application case; and
- 45 and 23 per cent for the moderate and intense use areas, respectively in the PDC.

[1702] The *FMSA* stated that Fort McKay considered the amount of disturbance associated with the application case and PDC in the FTSA to be a significant adverse effect that requires immediate mitigation and accommodation.

[1703] Fort McKay completed a land disturbance update in September 2012 which found that:

- the total existing direct disturbance within Fort McKay's traditional territory is estimated to be 99 469 ha or approximately 3 per cent of Fort McKay's total traditional territory of 3 625 037 ha. The disturbance effect increases to 1 140 991 or approximately 31 per cent of Fort McKay's total traditional territory if indirect buffer effects are included;
- when approved and planned development was considered, the amount of direct disturbance within Fort McKay's traditional territory increased to 326 460 ha or approximately 9 per cent of Fort McKay's traditional territory;
- within the FTSA, the total existing direct disturbance is estimated to be 43 639 ha or approximately 11 per cent of the 379 641 ha FTSA. The disturbance effect increases to 232 489 ha or 61 per cent of the FTSA if indirect buffer effects are included; and
- the amount of direct disturbance increases to 125 606 ha or approximately 33 per cent of the FTSA when approved and planned development is included.

[1704] In the *FMSA*, Fort McKay stated that the existing loss of traditional trails is a significant and adverse effect. Fort McKay stated that the trails are centered on the community and their loss has implications for travel and harvesting throughout its traditional lands. The loss of substantial portions of a trail can result in the entire trail network being disrupted. Fort McKay stated that it considered the loss of traditional trails to be permanent. While new trails could be created on reclaimed land, they could not be recreated to predevelopment conditions. Fort McKay also noted that the trails would cross entirely different landscapes and would require the community to harvest on reclaimed land, which would not exhibit the same characteristics as pre-developed land and thus may not be appropriate for traditional activities. Fort McKay expressed doubt that the reclaimed land would support equivalent wildlife, vegetation, and biodiversity or be culturally significant.

[1705] Fort McKay stated that the current population of the oil sands region is almost four times higher than the population of the predevelopment case because of the influx of newcomers. Fort McKay stated that the increase in population, the shrinking land base within its traditional lands, and the lack of policies or management plans to address the access and land use issues contribute to the conflict of use and as such, are impediments to the exercise of TLU. Fort McKay considered these impediments to be a significant and adverse effect under its base case scenario.

[1706] Fort McKay stated that extensive development in many of the watersheds within its traditional lands hamper TLU by impeding access to fishing areas, Kearl Lake, and trapline areas and threatened the sustainability of several watersheds. Fort McKay expressed concern that these watershed losses could have an impact on the Athabasca River, including impacts to flow, benthic drift, and regional fish spawning and rearing areas. Fort McKay considered five watersheds to be threatened and the Muskeg River watershed to be endangered in the base case. Fort McKay considered three watersheds to be threatened and three to be endangered in the application case. Fort McKay concluded that there would likely be significant adverse effects on all the watersheds assessed as threatened or endangered as there were no substantive watershed management plans in place.

[1707] In the *FMSA*, Fort McKay stated that some traditional use plant species are strongly associated with specific ecosite phases or wetland types. For example, bog cranberry is generally associated with treed bogs or fens, cloudberry was associated with treed bogs, tamarack is found in treed fens, red birch/bog birch is most common in fens, and rat root is found in swamps and open wetlands. Fort McKay also stated that several mosses with traditional uses are associated with bogs and fens and that sphagnum mosses are common to abundant in peatlands such as the treed bog, shrubby bog, open bog, treed poor fen, shrubby poor fen, and graminoid poor fen classes.

[1708] Fort McKay expressed concern that disturbance of wetlands within the FTSA will affect the availability of traditional use species or groups of plants usually found in various types of wetlands. Fort McKay stated that in the late 1990s to early 2000s, approximately 41 of the 114 known traditional use berry sites located in the FTSA (36 per cent of such sites) are associated with wetlands and 60 (53 per cent) are found in upland ecosystems.

[1709] The *FMSA* stated that about 42 per cent of the FTSA (160 508 ha) consisted of wetlands in the early 1990s and this area had declined by 28 per cent (i.e., by approximately 44 150 ha) in the base case. In the application case, it expected another 12 per cent of the wetlands that exist in the base case to be lost in the FTSA and 18 per cent of the wetlands in the base case to be lost in the PDC. According to the *FMSA*, this represents a cumulative loss of 58 000 ha or 36 per cent of the resource in the FTSA for the application case and a 40 per cent loss for the PDC. The *FMSA* stated that the loss of wetland area significantly reduced the area potentially available for use by the community of Fort McKay for gathering traditional use plants. Fort McKay stated that the cumulative decrease in wetlands associated with the application case and PDC represents a high magnitude, regional, far future, irreversible, medium frequency, adverse effect of high significance on gathering traditional use plants associated with wetlands.

[1710] The *FMSA* stated that of the 114 known traditional use berry sites in the FTSA, 53 sites (46 per cent) will be lost between the pre-development and base case scenarios. It predicted a cumulative loss of 59 sites (52 per cent) in the application case, with 38 per cent of the loss occurring since the late 1990s. The cumulative loss of known traditional use berry sites in the PDC was 62 sites or 54 per cent of the resource within the FTSA. Fort McKay considered the effects associated with the application case and PDC to be high magnitude, regional, far future, partially reversible to irreversible, medium frequency, adverse effects of high significance.

[1711] The *FMSA* included a Cultural Heritage Assessment Baseline (CHA Baseline) and a project-specific Cultural Heritage Assessment (CHA). The CHA Baseline provided a comprehensive assessment of cumulative impacts of industrial development on the cultural heritage of Fort McKay, with a focus on the specific influence of industrial development since it began in the early 1960s.

[1712] The CHA Baseline report focused on three key areas of cultural change: those that stem from changes to the land; those with connection to full time wage employment; and those that stem from changes in daily lives. The CHA Baseline report identified 12 cultural values and eight key activities that reflected Fort McKay's cultural values. The activities identified by the community include: hunting, fishing, trapping, berry picking, wage employment, education, visiting, and raising children. The approach used in the CHA Baseline report assumed that when changes in traditional activities occur, values—and ultimately Fort McKay's cultural heritage—are affected.

[1713] The CHA Baseline report identified the following stressors caused by industrial activity that adversely impact the ability and opportunity of the community to carry out traditional activities: loss of land, pollution, reduced access to land, industrial water use, wage economy, and increased population. Twenty three indicators were created and used to assist in measuring the impacts of the stressors on Fort McKay's culture and values.

[1714] Through the CHA Baseline assessment, Fort McKay determined that the current (2008) impact to its cultural heritage was significant and adverse. The assessment identified the following impacts on culture and values.

- Industrial activity has led to decreased opportunity for community members to carry out traditional harvesting activities including hunting, trapping, fishing, and gathering. This has lead to a weakening of values including the values of tradition, self-reliance, self-determination, rootedness, rhythm of nature, respect, cooperation, caring, purpose, connectedness, and peace.
- Industrial activity has led to decreased opportunity for community members to carry out traditional harvesting activities, and this decreased opportunity, when coupled with community members seeking full time wage employment with industry, has lead to a weakening of the cultural values of self-reliance, rhythm of nature, cooperation, and caring.
- Industrial activity has led to decreased opportunity for community members to carry out traditional harvesting activities, and this has lead to changes in daily life including child rearing, education, and visiting. These changes have resulted in a weakening of the cultural values of tradition, self-reliance, self-determination, rootedness, purpose, rhythm of nature, respect, cooperation, caring, connectedness, cohesion/bonding, and peace.

[1715] The project-specific CHA uses the same stressors and indicators used in the CHA baseline assessment to determine the impacts of Shell's projects on Fort McKay's cultural heritage. The CHA concluded that the application case and PDC will only exacerbate an already strained situation with respect to Fort McKay's cultural heritage.

[1716] The CHA baseline and CHA reports identified several strategies to recapture and maintain the cultural heritage of Fort McKay, including: cultural resilience; reclamation; language retention; land-based employment; further development; documentation of Fort McKay's cultural heritage; cumulative effects; regional initiatives; and development of a cultural heritage strategy.

[1717] The CHA report stated that these strategies will only partially moderate or offset Fort McKay's loss of TLU opportunities and the community's ability to exercise Aboriginal and treaty rights. The report stated that the governments need to develop further mitigation and accommodation measures with Fort McKay to address the cumulative effects of industrial development on their cultural heritage.

Analysis and Findings

Participation

[1718] The Panel notes that FMFN and FMMCA withdrew their statements of concern related to the Project and confirmed that Shell had addressed their project specific concerns.

[1719] The Panel notes that although FMFN and FMMCA withdrew their statements of concern, Fort McKay remains concerned about cumulative effects of industrial development in the Athabasca region and Crown consultation with respect to the assessment and management of these cumulative effects.

[1720] The Panel finds that the way in which Fort McKay participated in the hearing is problematic for the Panel for several reasons. The Panel is tasked with assessing the effects resulting from the Project, including any associated cumulative effects. In the context of this review process, the cumulative effects need to arise from the Project. By withdrawing its objection to the Project, Fort McKay appears to have satisfied itself that there will be no significant or unacceptable residual project effects. So from Fort McKay's perspective, the Project is unlikely to make a contribution to cumulative effects. The Panel understands that Fort McKay's concerns about cumulative effects go far beyond the current Project, however, the Panel is concerned that this hearing is not the proper forum for addressing those issues.

[1721] The Panel also notes that Fort McKay did not present any witnesses to speak to its evidence, nor was evidence filed by Fort McKay tested through questioning by Shell or the Panel. As a result, the Panel finds it cannot place much weight on some of the evidence submitted by Fort McKay, such as the recent disturbance updates to the *FMSA*. However, the Panel also notes that Shell filed the original *FMSA* as part of its evidence. The Panel interprets this to mean that while Shell may not necessarily agree with all of the details in the report, it generally supports the content and findings of the *FMSA*. The Panel is therefore able to rely on portions of the *FMSA* when considering the potential for cumulative effects to Fort McKay.

[1722] Notwithstanding the above issues, the Panel accepts that the community of Fort McKay is the community closest to the existing and proposed oil sands mines and is therefore the Aboriginal community most likely to be affected by this development. The Panel has determined based on the evidence provided by Shell and other parties, that the Project, in combination with other existing, approved and planned developments is likely to result in significant adverse cumulative effects to several resources of interest to Aboriginal groups including wetlands, old-growth forests, traditional plant potential, biodiversity, wetland and old-growth forest-reliant migratory birds and species at risk, including caribou. The Panel has also concluded that the Project is likely to result in significant adverse cumulative effects on Aboriginal TLU, rights, and culture.

[1723] Given the Panel's determination with respect to cumulative effects to TLU and other resources of interest to Fort McKay, the Panel is of the opinion that a consideration of the potential for cumulative effects to Fort McKay is warranted.

Rights Being Asserted

[1724] The Panel notes that many of the submissions of FMFN and FMMCA were joint submissions made collectively as the community of Fort McKay. These submissions often do not clearly distinguish between the rights being asserted by FMFN and those being asserted by the FMMCA, referring instead to the rights of Fort McKay. The Panel understands that from a legal perspective, the rights of First Nations and Métis groups may not be the same, particularly with respect to treaty rights.

[1725] The Agreement requires the Panel to consider the effects of the Project on asserted or established Aboriginal and treaty rights, to the extent the Panel receives such information. The Panel has not made any determinations as to the validity of the Aboriginal or treaty rights being asserted by Fort McKay or the strength of such claims but for the purposes of assessing the potential cumulative effects of the Project on Fort McKay's Aboriginal and treaty rights, the Panel accepts that Fort McKay has the rights being asserted.

Consultation

[1726] The Panel notes that Fort McKay did not raise any concerns about Shell's consultation efforts and that both FMFN and FMMCA signed agreements with Shell to mitigate their project-specific concerns.

[1727] The Panel notes Fort McKay's concerns about what it described as the "wholesale taking up of lands" within its traditional territory and the lack of consultation by Alberta and Canada with respect to the assessment and management of the cumulative effects of oil sands development. The Panel recognizes that Alberta did not participate in the hearing and so the Panel did not have the benefit of Alberta's perspective on the consultation issues raised by Fort McKay. Similarly, the Panel notes that Canada did not present a witness respecting Canada's perspective on consultation issues, although Canada did provide its general perspective on consultation during its closing argument.

[1728] The Panel decided at the outset of the hearing that it would not rule on the adequacy of Crown consultation as it did not have the jurisdiction to do so, and even if it did have the jurisdiction, it would be premature to do so as there would be further opportunities for consultation before Crown decisions are made or authorizations issued for the Project. The Panel notes that both Alberta and Canada stated in the NQCL process that the consultation process was not yet complete and that there would be additional opportunities for consultation after the Panel's report had been completed and before Crown decisions or regulatory authorizations were issued for the Project. The Panel notes that Canada also confirmed this was the case during its closing argument. The Panel has therefore included a recommendation that before other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with each of the Aboriginal groups in light of the issues identified in this report to determine if additional consultation is necessary to address these issues, including likely significant adverse Project and cumulative effects to a number of resources important to Aboriginal people and likely significant adverse cumulative effects to Aboriginal traditional land use, rights and culture.

[1729] With respect to Fort McKay's request that the Panel recommend to Canada and Alberta that they appoint negotiators with the necessary mandate to negotiate accommodation measures with Fort McKay, the Panel does not feel that this recommendation is within the Panel's mandate and declines to make the recommendation.

Cumulative Effects on Traditional Land Use, Rights, and Culture

[1730] The Panel notes that FMFN and FMMCA participated jointly in the review process and the majority of submissions were joint submissions from Fort McKay. The submissions, including the *FMSA*, do not generally distinguish between FMFN and FMMCA as the source of the TEK or TLU information. The Panel accepts Fort McKay's assertions that that the TLU activities and cultural practices of FMFN and FMMCA members are very similar.

[1731] The Panel recognizes that Shell's updated CEA predicts higher levels of disturbance for the CSEs than predicted by Fort McKay in the *FMSA*. The Panel believes that Shell's results are more current and take into account the disturbance caused by forest fire, which was not considered in the *FMSA*. The Panel believes that the results submitted by Shell better reflect the amount of disturbance for the base and application cases. Thus, the Panel relies on Shell's evaluation of the amount of disturbance for its determination of significance.

[1732] The Panel notes that according to Shell's assessment (see the Shell's Assessment of Effect on Aboriginal Traditional Land Use, Rights, and Culture section), the amount of disturbance in the moderate and intense use areas for the all-traditional-uses, large-game-harvesting, and traditional-plant-harvesting CSEs is already significant in the base case, ranging from 19 to 47 per cent depending upon the CSE and case considered. This suggests that the level of disturbance associated with existing and approved projects and other disturbances in the CSEs is already significant. The observed increases are largest in the moderate and intense use areas, which are the areas most valued by Fort McKay. The Panel acknowledges that some of this large increase is attributed to the effects of forest fires.

[1733] The Panel notes that the total amount of disturbance for the application and PDC ranges from 19 to 55 per cent depending upon the CSE and case under consideration and the Panel considers these values to be significant. According to Shell's assessment almost half of the area of intense traditional plant harvesting of Fort McKay is disturbed in the 2012 base case (47 per cent) and that more than half (55 per cent) of the intense use area for traditionally used plants would be disturbed in the PDC if all of the projects proceeded as planned. The Panel notes that for the all-traditional-uses and large-game-harvesting CSEs, the percentage of disturbance in areas of intense use is generally over 30 per cent in the base case and close to 40 per cent in the PDC.

[1734] The Panel notes that the amount of disturbance in the moderate and intense use areas in the application case is only slightly higher than in the base case, supporting Shell's view that the Project makes a relatively small contribution to the effects observed in the application case and PDC.

[1735] The Panel considers the cumulative loss of 46 per cent of the traditional use berry sites within the FTSA in the base case, and losses of 52 and 54 per cent in the application case and PDC, to be significant.

[1736] The Panel acknowledges Fort McKay's concerns about the impact disturbances have on other resources important to its TLU including wetlands, watersheds, and traditional trails.

[1737] The Panel finds that existing and approved projects and other disturbances are likely already having a significant adverse cumulative effect on the TLU activities of Fort McKay. Notwithstanding the agreement Fort McKay has with Shell with respect to mitigation of project-specific effects, the addition of the Project and other planned projects are likely to exacerbate these effects. The Panel believes that the finding of significant adverse effects to Fort McKay's TLU is consistent with the Panel's other findings of significant adverse cumulative effects to wetlands, old-growth forests, traditional plant potential, biodiversity, and wetland- and old-growth-reliant migratory birds and species at risk, including caribou.

[1738] The Panel found the CHA baseline and project-specific CHA provided as part of the *FMSA* provided a comprehensive and sound assessment of the impacts of oil sands and industrial development on the cultural heritage of Fort McKay from Fort McKay's perspective. The Panel found the reports very helpful in furthering the Panel's understanding of the impacts of development on Fort McKay's cultural heritage. The Panel considered both Shell's and Fort McKay's cultural assessment information in its determination of significance.

[1739] Fort McKay produced evidence that the removal of traditional lands around the hamlet of Fort McKay, combined with the widespread avoidance of use caused by a variety of factors, such as perceived contamination of resources and impediments to accessing traditional lands by ground or water routes, have become serious impediments to the exercise of Fort McKay's TLU. The Panel understands that these impediments to land use further combined with the socioeconomic changes induced by the oil sands industry, such as the cost of housing, the large influx of non-aboriginal persons in the region and increased job availability within the oil sands industry, all increase the reliance of Fort McKay on the wage-economy at the expense of traditional activities.

[1740] The Panel believes that the oil sands industry has contributed to the socioeconomic and cultural changes experienced by Fort McKay by affecting its land use, contributing to the avoidance and loss of use of traditional lands, and increasing its reliance on the wage economy. Some of the effects, such as increased income levels, have been positive while others, such as loss of language or opportunities for TLU activities, have been negative. The Panel believes that the above effects are long term and that the cultural changes experienced by Fort McKay will likely increase further in the future.

[1741] The Panel finds that the cumulative effects on some elements of Fort McKay's cultural heritage are already adverse, long-term, likely irreversible, and significant. The Panel believes that the application case and PDC will further increase these effects if projects proceed as planned.

[1742] The Panel is of the opinion that people's cultures are naturally evolving and that the adverse aspects of cultural changes can be mitigated when people have control over the changes experienced in their daily life. In order to mitigate the adverse effects on the land use and culture of Fort McKay and the other Aboriginal groups, the Panel has recommended greater involvement of First Nation and Métis groups in regional planning and in the stewardship of the traditional resources.

Mikisew Cree First Nation

Evidence

Participation and Requested Disposition

[1743] MCFN's participation in the review process and hearing is discussed in the Section Participant Involvement in the Review Process.

[1744] MCFN withdrew its objection to the Project shortly before the hearing but remained concerned about cumulative effects related to development in the Athabasca region and Crown consultation.

[1745] MCFN did not object to approval of the Project but made several recommendations to the Panel regarding the management of cumulative effects and Crown consultation. A list of these recommendations is provided in Appendix 8.

Rights Being Asserted

[1746] MCFN stated that it was an Indian band in accordance with the *Indian Act*. MCFN submitted that approximately 2800 persons were registered as members of MCFN, representing approximately 50 per cent of the Aboriginal peoples in RMWB. MCFN stated that approximately half of its members live in and around Fort Chipewyan. Most of the remainder live in the vicinity of Fort McKay and Fort McMurray. MCFN also stated that its population is growing and that greater traditional resources would likely be required to sustain MCFN's traditional use activities and rights into the future.

[1747] MCFN stated that its traditional lands extend around Lake Athabasca over the entire PAD and south to and including Fort McMurray and the Clearwater River. MCFN stated that the Project location and the study areas used by Shell to assess the potential extent of cumulative effects of the Project are within MCFN's traditional lands.

[1748] MCFN stated that it held constitutionally protected rights under Section 35 of the *Constitution Act, 1982* and under Treaty 8. MCFN asserted that under Treaty 8 harvesting practices should be protected and not limited or interfered with to such an extent as to render them meaningless. MCFN argued that Treaty 8 provided that there would be a balanced sharing of the land while MCFN would be guaranteed the continuation of its way of life and livelihood, including the conditions required to meaningfully hunt, trap, fish, and gather within its traditional lands. MCFN stated that it is determined to preserve, develop, and transmit to future generations its ancestral territories and distinct identity in accordance with MCFN cultural patterns and social institutions, as promised in Treaty 8.

Adequacy of Consultation by Shell

[1749] MCFN did not raise any concerns during the hearing about Shell's consultation efforts.

Adequacy of Consultation by the Crown

[1750] MCFN expressed concern that the Governments of Alberta and Canada were failing to uphold the honour of the Crown in their approach to the assessment and management of cumulative effects in the Lower Athabasca Region. MCFN stated that Alberta and Canada were not meaningfully consulting about cumulative effects to MCFN's treaty and Aboriginal rights and that there was a need for a rights-based cumulative effects monitoring program or framework in the region.

[1751] MCFN expressed concern that Alberta did not participate in the joint review panel process but hoped that Alberta would comply with its obligations in the light of the information gleaned from the panel process. MCFN stated that it was frustrated by the government's failure to heed advice from and work constructively with MCFN. MCFN stated that it appeared to MCFN that Alberta and Canada were both working hard to avoid rather than observe their treaty obligations.

[1752] MCFN expressed concern that although Alberta and Canada had recently committed to creating a world-class monitoring system for the Lower Athabasca Region, they have excluded MCFN and a consideration MCFN's rights. MCFN also stated that Alberta and Canada had informed MCFN that they would no longer be including MCFN in the development of a surface water quantity framework for the region. MCFN also stated that Alberta had recently finalized the *LARP* without a meaningful consideration of MCFN's rights and culture, despite extraordinary measures by MCFN to have Alberta take MCFN's rights and culture seriously.

[1753] MCFN stated that Alberta and Canada recently declined to assist MCFN in developing a Traditional Land and Resource Use Management Plan (TLRUMP) that could be used to guide effective management of cumulative effects of development on MCFN's rights and culture. MCFN argued that Alberta and Canada should fund the development of a TLRUMP as such a plan would provide the thresholds, limits, and criteria required to measure the cumulative impacts of development on Aboriginal and treaty rights.

[1754] MCFN stated that it should be consulted and involved in the monitoring of cumulative effects and in regional planning and asked the Panel to issue specific recommendations to Alberta and Canada regarding the study and management of cumulative effects of oil sands development on MCFN's traditional lands, rights, and culture. MCFN believed that Alberta and Canada were not listening to its concerns but that the Governments have shown a willingness to listen to and implement recommendations from previous joint review panels.

[1755] MCFN provided a list of specific recommendations that it would like the Panel to make to Alberta and Canada. The recommendations cover a range of issues, including but not limited to:

- funding, development, and implementation of a traditional land and resource use management plan (TLRUMP);
- greater participation of MCFN and other Aboriginal groups in regional land use planning, policy development and monitoring initiatives;

- funding to complete a regional cumulative effects study which includes comprehensive TLU and ecological knowledge;
- increased emphasis on protecting culturally important species such as caribou, bison, and moose;
- completion of a traditional food study to address community concerns about potential contamination of traditional foods; and
- a comprehensive community health study for Fort Chipewyan.

[1756] MCFN also argued that to meet its mandate, CEMA should be adequately funded.

[1757] MCFN urged the Panel to make recommendations to Alberta and Canada to "stop ignoring Aboriginal peoples such as the Mikisew, when determining how to appropriately assess, monitor and manage the cumulative effects on First Nation's rights and culture".

Cumulative Effects on Traditional Land Use, Rights, and Culture

[1758] MCFN completed a project-specific TLU use study in February 2012. The results were summarized in the report *Indigenous Knowledge and Traditional Use Report for Shell Canada's Proposed Jackpine Mine Expansion, Pierre River Mine, and Redclay Compensation Lake*. MCFN stated that in order to assess the effects of industrial development on its land use, it selected an RSA within which direct or indirect effects of the PRM and the Project may be anticipated, such as noise, dust, odours, access management activities, traffic, effects on water, and other forms of disturbance. MCFN stated that the RSA included a buffer of 25 km around the PRM and the Project footprints and a buffer of 5 km on either side of the Athabasca River, downstream to the Athabasca delta. MCFN explained that the RSA included the Redclay Compensation Lake and the PAD.

[1759] MCFN identified almost 6000 MCFN site-specific use values in the RSA, the majority of them along the Athabasca River and in the PAD. MCFN stated that 375 site-specific use values were less than 5 km from either the PRM or the Project footprints.

[1760] MCFN stated that it considered an effect to be significant when it likely results in:

- strong concerns or interest by MCFN members; and
- clearly discernible changes to the preferred exercise of a culturally important practice or land, water, or resource use or right.

[1761] MCFN stated that based on the PIC, the cumulative effects of existing industrial development on its indigenous knowledge and use within its RSA has clearly been significant and adverse.

[1762] MCFN stated that the values affected by the cumulative effects of the industrial development in its assessment in its RSA include

- quality and quantity of water, fish, and aquatic resources;

- culturally important species (including quality and quantity of high value moose habitat, and adjacent reported caribou habitat);
- access and enjoyment of MCFN lands (MCFN reserves, traplines, the Athabasca River corridor, etc.); and
- intangible cultural resources such as transmission of MCFN language, knowledge and sense of place, social and cultural cohesion across communities, and ability of MCFN members to exercise their traditional activities and lifestyle.

[1763] Shell stated that the 2012 PDC assessment compared the amount of PDC disturbance within the terrestrial RSA to the total area of First Nations' traditional territories. Shell stated that in the base case, the area of disturbance within the portion of the MCFN's traditional lands that overlaps the terrestrial RSA is 523 501 ha. Shell stated that in the PDC the area of disturbance within the portion of the MCFN's traditional lands that overlaps the terrestrial RSA is 646 250 ha. Shell stated that these amounts are 6 and 7 per cent of the entire traditional land of MCFN. Shell noted that in the PIC, the man-made disturbances in the MCFN's RSA represent about 1.3 per cent of the MCFN's traditional territory.

[1764] MCFN stated that areas of general loss of use extend well beyond the existing physical footprint of oil sands development. Existing loss of use within the RSA is due to a range of factors including terrestrial disturbance, industrial contaminants, poor water quality, low water quantity, safety issues, and loss of access due to fencing, gated roads, and other oil sands activities.

[1765] MCFN stated that, along the Athabasca River and elsewhere in the RSA, areas of site-specific use values in relation to subsistence, habitation, and other uses are now partly or fully avoided due to perceived contamination or other concerns. MCFN also indicated that a combination of factors is what leads to avoidance of use. For example, MCFN members avoid hunting moose due to perceived contamination, poor health of the moose, less moose in the area, and difficulty accessing the hunting grounds.

[1766] MCFN stated that the Kearl Lake area has suffered from an intensification of industrial impacts since the late 1990s. MCFN stated that the physical disturbance of lands, traffic, noise, and concerns regarding contamination have resulted in general loss of use of the Kearl Lake area by many MCFN members. MCFN stated that the quality of the resources in the Kearl Lake area, including water and meat, are important concerns. MCFN stated that the area south of the Firebag River saw a widespread loss of use due to the development of the oil sands industry. MCFN stated that its members avoided using this area because of fear of contamination, poor quality of the traditional resources, and impediments to access. MCFN stated that this large area has reached a threshold of disturbance within the RSA resulting in a widespread loss of use. MCFN further stated that the existing cumulative industrial effects have already resulted in significant changes in Mikisew knowledge, use, and way of life.

[1767] MCFN stated that its population is widely dispersed, with the majority of its members living off reserve, in Fort McMurray, Fort Chipewyan and other more southern locales. MCFN further stated that its members living in southern areas tend to use nearby resources, though many return to Fort Chipewyan and surrounding territories on a regular basis.

[1768] MCFN expressed doubt that reclamation of mined areas will be successful in providing opportunities for MCFN knowledge and use that are equivalent to what exists naturally. MCFN stated that even if an oil sands mine operator could reclaim the land, it considered the removal of lands from Aboriginal use for periods of time that exceed one generation "permanent" for the purposes of traditional use as it interrupts knowledge transmission.

[1769] MCFN stated that the Athabasca River was a critical transportation corridor for accessing MCFN territories and traditional use was vulnerable to low water conditions. MCFN explained that the low water level of the Athabasca River and PAD affects the access and use of traditional land, Indian Reserve lands, and seasonal villages. MCFN stated that a large number of the tributaries of the Athabasca River were difficult to navigate in low-flow conditions and that there were several locations on the Athabasca River where navigation was difficult because of hazards (sand banks, shallow water, etc.). MCFN stated that because of low flow conditions, navigation was also difficult in many secondary water streams in the PAD.

[1770] MCFN indicated that perceived contamination of water and resources that utilize the water has the most impact on MCFN traditional knowledge and use. MCFN members have observed changes in the quality of water and aquatic resources concurrent with the development of the oil sands industry, including perceived abnormalities in fish and contamination of medicinal plants in the Athabasca River system. MCFN stated that its members now avoid fishing in the Muskeg River due to observed abnormalities in fish from the area and fears regarding contamination from existing oil sands operations.

[1771] MCFN indicated that changes in the environment contribute to its members' loss of confidence in the quality of fish, water, moose, and other aquatic resources and are having a serious effect on the continued practice of MCFN knowledge and use in the RSA.

[1772] MCFN stated that additional oil sands development along the Athabasca River was likely to exacerbate existing impacts on water level and quality and add cumulatively to the existing effects on MCFN's ability to exercise its rights on and around the Athabasca River, and within Wood Buffalo National Park.

[1773] MCFN stated that moose, bison, woodland caribou, and migratory birds are culturally important species. MCFN expressed concerns over cumulative effects on the health and sustainability of moose and migratory birds. MCFN also expressed concerns over the observed decline of the muskrat population in the PAD.

[1774] MCFN reported that moose in the oil sands region, specifically in the Kearl Lake area, do not taste as good as the moose from other areas such as the Birch Mountains (located 80 km from the oil sands region). MCFN expressed concern about the health of moose and was of the opinion that the fallout and dust from oil sands mining operations may contaminate plants and contribute to the poor health of moose.

[1775] MCFN members have reported changes in bird migration patterns, including ducks and geese, and overall declines in the availability of migratory birds as a result of oil sands development. These changes were reported by MCFN to have affected the quantity of birds available for the MCFN's spring and fall bird hunt, particularly in the area of the PAD.

[1776] Some MCFN members also expressed concerns over the low population of muskrats in the PAD and attributed this to the drying of this region.

[1777] MCFN stated that the effects from oil sands and related development have resulted in the widespread loss of use by MCFN members of the area of oil sands operations and downstream to Fort Chipewyan. MCFN also stated that the cumulative effects of the industrial development contributed to an out-migration from Fort Chipewyan and MCFN on-reserve communities.

[1778] MCFN explained that actions that destroy a place, or cause the use of a place to be lost (for example, because of fear of contaminants), especially over long periods of time, frequently result in a gap in the transmission of place-based knowledge. This can have the effect of eliminating the place as a cultural resource for remembering, teaching, and learning the knowledge associated with it. MCFN stated that concerns regarding wild foods and environmental contaminants can create barriers for the transmission of cultural knowledge.

[1779] MCFN identified concerns regarding the potential impacts of oil sands developments on intangible cultural resources, including language and the transmission of knowledge regarding areas that are lost due to industrial effects.

[1780] MCFN stated that existing industrial pollution, and declines in the quantity and quality of lands and waters available for MCFN practice of rights have already resulted in adverse, significant cultural changes.

Analysis and Findings

Participation

[1781] The Panel notes that that MCFN withdrew its statement of concern to the Project and confirmed that Shell has addressed MCFN's project-specific concerns to MCFN's satisfaction.

[1782] The Panel also notes that although MCFN withdrew its statement of concern, MCFN remains concerned about the cumulative effects of industrial development in the Athabasca region and Crown consultation with respect to the assessment and management of these cumulative effects.

[1783] The Panel finds MCFN's participation in the hearing problematic from several perspectives. The Panel is tasked with assessing the effects resulting from the Project, including any associated cumulative effects. In the context of this review process, the cumulative effects need to arise from the Project. By withdrawing their objection to the project, MCFN appears to have satisfied itself that there will be no significant or unacceptable residual project effects. So from MCFN's perspective, the Project is unlikely to make a significant contribution to cumulative effects. The Panel understands that MCFN's concerns that cumulative effects go far beyond the current Project and the Panel is concerned that this hearing is not the proper forum for addressing those issues.

[1784] Furthermore, the Panel notes that MCFN did not present any witnesses to speak to its evidence, nor was its evidence tested through questioning by Shell or the Panel. As a result, the Panel finds it cannot place much weight on the evidence submitted with respect to MCFN's current use of the lands and resources in the vicinity of the Project and the cumulative effects of development on its land use, rights, and culture.

[1785] Notwithstanding the above concerns, the Panel has determined based on the evidence provided by Shell and other parties, that the Project, in combination with other existing, approved and planned developments is likely to result in significant adverse cumulative effects to several resources of interest to Aboriginal groups including wetlands, old-growth forests, traditional plant potential, biodiversity, wetland-reliant species at risk and migratory birds, old-growth forest-reliant species at risk and migratory birds, including caribou. The Panel has also concluded that the Project, in combination with other existing, approved, and planned projects and activities is likely to result in significant adverse cumulative effects to TLU in the area around the Project.

[1786] Given the Panel's determination with respect to TLU and other resources of interest to MCFN, the Panel is of the opinion that the cumulative effects resulting from the Project remain of interest for the assessment of the cumulative effects to the MCFN.

Rights Being Asserted

The Agreement requires the Panel to consider the effects of the Project on asserted or established Aboriginal and treaty rights, to the extent the Panel receives such information. The Panel has not made any determinations as to the validity of the Aboriginal or treaty rights being asserted by MCFN or the strength of such claims but for the purposes of assessing the potential cumulative effects of the Project on MCFN's Aboriginal and treaty rights, the Panel accepts that MCFN has the rights being asserted.

Consultation

[1787] The Panel acknowledges MCFN's frustration by what it perceives to be the unwillingness of Alberta and Canada to meaningfully consult with and work cooperatively with MCFN on the assessment and management of cumulative effects issues that have the potential to affect MCFN's TLU, rights and culture. The Panel recognizes however that Alberta did not participate in the hearing and so the Panel did not have the benefit of Alberta's perspective on the consultation issues raised by MCFN. Similarly, the Panel notes that Canada did not present a witness to speak to Canada's perspective on consultation issues, although Canada did confirm during its final argument that there would be further opportunities for consultation with respect to the Project.

[1788] The Panel decided at the outset of the hearing that it would not rule on the adequacy of Crown consultation as it did not have the jurisdiction to do so, and even if it did have the jurisdiction, it would be premature to do so as there would be further opportunities for consultation before Crown decisions are made or authorizations issued for the Project. The Panel notes that both Alberta and Canada stated in the NQCL process that the consultation process was not yet complete and that there would be additional opportunities for consultation after the Panel's report had been completed and before Crown decisions or regulatory authorizations were issued for the Project. The Panel notes that Canada also confirmed this was the case during its closing argument. The Panel has therefore included a recommendation that before other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with each of the Aboriginal groups in light of the issues identified in this report to determine if additional consultation is necessary to address these issues, including likely significant adverse Project and cumulative effects to a number of resources important to Aboriginal people and likely significant adverse cumulative effects to Aboriginal traditional land use, rights and culture.

Cumulative Effects on Traditional Land Use, Rights, and Culture

[1789] The Panel notes that Shell assessed cumulative effects to TLU by assessing the amount of disturbance in its terrestrial RSA and the cumulative effects to resources. The Panel finds that Shell's approach for the assessment of cumulative effects on TLU does not consider whether there are other factors (sociocultural, economic, etc.) that contribute to MCFN's ability or desire to exercise particular rights. The Panel believes that a sound assessment of the cumulative effects on MCFN's rights and interests would include an assessment of the combined effects of noise, odours, impeded access, perceived contamination of resources, cultural factors, etc. on the practice of traditional activities. The Panel notes that MCFN's assessment of cumulative effects provides a better understanding of the effects on MCFN's TLU than Shell's assessment as it takes a more comprehensive view of the range of factors that influence whether and how MCFN exercises TLU activities and rights.

[1790] The Panel is of the opinion that Shell's comparison of the total disturbance in the RSA to the entire traditional territory of the MCFN is inappropriate because it assumes that all potential resource locations are of equivalent value and can be easily accessed by all traditional users. This may not be the case. MCFN stated that almost half of its members live in Fort McMurray and Fort McKay and use the nearby, more affected territory for their TLU activities. The Panel believes that it would be difficult for traditional land users to find traditional territories with value equivalent to the value of the territory lost to development, given that most of the industrial development is located along the Athabasca River, which is a main water route for the exercise of traditional activities by MCFN.

[1791] The Panel notes that MCFN provided evidence of already existing adverse effects to its site-specific use values in its RSA and indicated that there are existing significant cumulative effects to its TLU. The Panel notes that several these use values are located south of the Firebag River in an area of heavy oil sands development where the MCFN has indicated there is loss of land and avoidance of use.

[1792] The Panel believes that avoidance and loss of use are important factors for the determination of the significance of the existing cumulative effects on MCFN's TLU. The Panel finds that the existing cumulative effects on MCFN's TLU from the oil sands industry and related development is of high magnitude and geographically extensive as it occurs over a large area south of the Firebag River. As the existing effects from the current mining operations will be experienced for many more years and because more projects that are planned may be approved in the future, the Panel believes that cumulative effects from the oil sands industry and related development will be experienced over the long term. The Panel also believes that the loss of use for the MCFN is likely irreversible, as it has not been demonstrated how some lands used for the oil sands industry will be reclaimed to an equivalent value for TLU and these lands will be unavailable for more than one generation.

[1793] The Panel concludes that cumulative effects on the TLU of the MCFN appear to be significant and adverse in the base case and that the application case and PDC will likely add to the existing significant and adverse effects. Given the Panel's finding of significant adverse cumulative effects to a number of resources important to Aboriginal people and Aboriginal TLU and rights, the Panel has recommended that Alberta, in collaboration with Canada, the Aboriginal groups and other stakeholders, develop and implement a TLU management framework as part of the *LARP*.

[1794] The Panel notes MCFN's concerns that the Athabasca River is increasingly difficult to navigate. The Panel acknowledges that changes in navigation may be occurring but believes the reasons for the observed changes are not clearly understood and are likely the result of a combination of factors, including but not limited to a discontinuation of dredging and the formation of sand bars, variation in water flows due to natural wet-dry cycles or climate change, and water withdrawals by oil sands operations and other upstream water users. Based on Shell's commitment to complying with existing flow allocation restrictions outlined in the current *Water Management Framework for the Lower Athabasca River Phase 1* and with future Phase 2 conditions and the negligible effects from Project related water withdrawals on regional water flows, the Panel concluded that the Project was unlikely to result in significant adverse Project or cumulative effects to water levels or navigation in the Athabasca River or PAD. The Panel therefore also concluded that the Project is unlikely to result in adverse Project or cumulative effects to Aboriginal traditional use or aboriginal or treaty rights resulting from adverse effects to navigation. Notwithstanding that the Panel has concluded that the Project is not likely to result in significant adverse effects to water levels or navigation in the Athabasca River, the Panel has included a number of recommendations to Canada and Alberta concerning the Phase 2 of the *Water Management Framework for the Lower Athabasca River*.

[1795] The Panel acknowledges that the drying of the PAD is also a major concern for MCFN and has a large impact on its TLU. The Panel believes that the causes for the drying of the PAD are also not well understood, but likely involve several causes acting together including the construction and operation of the Bennet Dam. The role that water withdrawals by the oil sands sector plays is unclear and the Panel concluded that the Project was unlikely to result in significant adverse Project or cumulative effects to water levels or flows in the Athabasca River or PAD. However, due to the importance of this issue to the Aboriginal groups, the Panel has included a recommendation that EC and AESRD, in collaboration with the interested Aboriginal groups, conduct research and report on the causes of the apparent drying of the Athabasca oil sands region and the PAD.

[1796] The Panel notes MCFN's concerns related to the quality of surface water. The Panel concluded that the Project that was not likely to result in significant adverse effects to water quality, including the Athabasca River and PAD.

[1797] The Panel acknowledges MCFN concerns over the perceived poor quality of surface water and traditional foods. The Panel notes that this perception may have a significant impact on MCFN TLU and use of traditional resources. The Panel believes that the loss of traditional use due to concerns about contamination may be significant, but is potentially reversible. To avoid further loss of TLU due to concerns over the quality of surface water and traditional foods, MCFN and other Aboriginal land users need to be confident that the quality of surface water and traditional foods is not being adversely affected by oil sands operations. The Panel believes that the new joint provincial-federal monitoring program being implemented by Alberta and Canada could play an important role in providing this confidence. However, if Aboriginal people are to have confidence in the data reported, Aboriginal organizations such as MCFN need to be engaged in the monitoring process. The Panel therefore recommends that the Governments of Canada and Alberta ensure that First Nation and Métis groups in the Lower Athabasca Region are effectively engaged in the new joint provincial-federal monitoring initiatives.

[1798] Although the Panel did not find significant adverse cumulative effects to human health, the Panel acknowledges MCFN's concerns about the impacts of oil sands development on the health of MCFN members living in Fort Chipewyan. The Panel has included a recommendation that Alberta Health and Wellness and HC complete a regional baseline health study focused on First Nations, Métis, and other Aboriginal groups that considers all relevant health factors, including environmental exposures and potential exposure pathways such as water, air, and consumption of traditional foods.

[1799] The Panel understands that moose are an important source of food for MCFN. The Panel notes that MCFN expressed concerns over the health and taste of moose and the sustainability of the moose population. Based on the evidence presented, the Panel concluded that the Project, in combination with other existing, approved and planned projects was not likely to result in significant adverse cumulative effects to moose populations of the health of moose. However, the Panel did note that there is both TEK and scientific evidence to suggest a decline in moose populations has been occurring, although the reasons for the decline are not clear. As a result, the Panel has included a recommendation that Alberta assess the health and long-term sustainability of moose in the oil sands area in collaboration with interested Aboriginal groups as part of *LARP*.

[1800] The Panel notes that MCFN expressed concerns over the decline in the number of migratory birds available for the spring and fall bird hunt. The Panel further notes that EC confirmed that migration routes have changed but that the reasons for such changes are not understood. The Panel has included a recommendation to the Governments of Alberta and Canada that, in collaboration with interested Aboriginal groups and stakeholders, they initiate a joint effort to determine if there has been a decline of waterfowl in the oil sands region and/or if migration routes have changed. The Panel has further recommended that if results suggest that there has been a decline, or if the routes have changed, the Panel recommends that the Governments of Canada and Alberta work together to determine the causes.

[1801] The Panel notes that the oil sands industry has contributed to the socioeconomic and cultural changes experienced by MCFN by affecting its land use, contributing to the avoidance and loss of use of traditional lands, and increasing its reliance on the wage economy. Some of the effects, such as increased income levels, have been positive while others, such as loss of language or opportunities for TLU activities, have been negative. The Panel believes that the above factors are long term and that the cultural changes experienced by MCFN will likely increase further in the future. As a consequence, the Panel is of the opinion that the Project, in combination with other existing, approved, and planned oil sands projects and related development is likely to continue to have significant adverse cumulative effects on the intangible elements of MCFN's culture.

[1802] The Panel is of the opinion that people's cultures are naturally evolving and that the adverse aspects of the cultural changes can be mitigated when people have control over the changes experienced in their daily life. In order to mitigate the adverse effects on the land use and culture of MCFN and the other Aboriginal groups, the Panel has recommended a greater involvement of the First Nations and Métis groups in regional planning and in the stewardship of the traditional resources.

REGIONAL EFFECTS

[1803] The assessment of regional issues and challenges in project-specific review processes for mineable oil sands has been hampered by the absence or limited coverage of policy frameworks, regional and integrated land use plans, and impact thresholds. This has created uncertainty about the appropriate treatment for regional cumulative effects by review panels.

[1804] The Panel has received evidence, reached conclusions, and made recommendations in this report that deal with cumulative effects as they relate to the Project. The Panel recognizes that project environmental assessments are not the ideal forum to address cumulative effects at a regional level. For example, cumulative effects result from all activities and kinds of developments in the region, not only oil sands mines. It is important that these cumulative effects be considered in the broader regional perspective and in the context of government strategies, plans, and environmental thresholds.

[1805] In August 2012, the Government of Alberta approved the *LARP*, the first of seven regional plans under Alberta's Land Use Framework (LUF). The Panel recognizes the importance of this regional plan as a framework for enhancing environmental management, addressing growth pressures, and supporting economic development on a regional, cumulative basis for all types of development, including oil sands. Under the *LARP*, Alberta has established management frameworks for some aspects of air quality, surface water quality, and groundwater, and plans to continue with other aspects. It has also established new conservation areas and parks. The *LARP* also contemplates, among other things, the establishment of frameworks for biodiversity, tailings management, and surface water quantity. The province will set land disturbance, air, and water impact thresholds pursuant to the management frameworks.

[1806] While the *LARP* is an essential first step, its value will be fully realized only when all of its frameworks and thresholds are in place. The Panel encourages the Government of Alberta to continue the processes associated with implementation of the *LARP* on an urgent basis.

[1807] The Panel would like to address the following cumulative or regional effects that have been brought to its attention during this review process. These regional effects may or may not be contributed to directly by the Project.

Integrated Land Use Planning

[1808] The *LARP* includes a commitment to develop an integrated, watershed-based, landscape management plan for public lands in the Green Area (forested portion of Alberta public land) in 2013. Presently, there are several instruments, guiding documents, and integrated resource plans in place for the region created before the *LARP*. The Panel finds the existing plans of limited use because they are at varying scales, out of date, and not reflective of the present state of development. The *LARP* indicates that development decisions on Crown lands will have to be in compliance with the regional plan to achieve the regional outcomes established in the plan and that existing subregional plans will be reviewed for their relevance and incorporated as appropriate into the *LARP*. The Panel recommends that the Governments of Canada and Alberta incorporate both the biodiversity management framework and a comprehensive assessment of Aboriginal TLU into the development of the regional landscape management plan. The Panel believes it is critical that these are incorporated even if the completion of the integrated landscape management plan is delayed.

Aboriginal Traditional Land Use

[1809] The Panel finds that regional effects are significant to Aboriginal TLU. It is apparent to the Panel that the mitigations that are proposed by individual project proponents to mitigate effects on TLU are not entirely effective. Currently, the main mitigation measure used in oil sands development is reclamation which is proposed to mitigate most effects on the environment. While this measure has yet to be proven to mitigate environmental effects, it is clear that it does not mitigate most effects on TLU as these effects go beyond environmental effects.

[1810] It is unclear whether a reclaimed landscape will ever be suitable for TLU as evidence brought forward in this review suggests. Reclamation success is uncertain and there is a significant time lag (measured in generations) between disturbance and completion of reclamation. Also, the reclaimed landscape will be fundamentally different from predisturbance conditions. The Panel recommends that the Governments of Canada and Alberta ensure that Aboriginal groups are involved in reclamation planning to help better design these plans to include Aboriginal TLU requirements, such as valued traditional species and culturally important landscapes.

[1811] The *LARP* does not specifically address TLU but instead provides for continued consultation with Aboriginal peoples and engagement to help inform land and natural resource planning in the region. Several the Aboriginal groups expressed concern that the *LARP* does not address their concerns and does nothing to ensure ongoing traditional use of the land. Also, the absence of a management framework and associated thresholds makes it very difficult for both industry and the Panel to evaluate the impact of individual projects on TLU. The Panel believes that to be better able to accomplish and inform land use planning, a TLU management framework should be developed for all Aboriginal people affected by industrial development in the Lower Athabasca Region.

[1812] ACFN discussed in detail its proposed Traditional Resource Use Management Plan or TRUMP (for a more detailed description of TRUMP refer to Effects on Aboriginal Traditional Land Use, Rights, and Culture section). The ACFN requested that approval of the Project be deferred until the completion of the TRUMP. The ACFN emphasized that binding thresholds and measures must be set in advance in order to allow regulators to condition permits and authorizations in a manner that protects and prioritizes Aboriginal treaty rights. ACFN stated that the TRUMP would provide the decision makers with information on the minimum requirement for quantity and quality of traditional resources to maintain TLU and exercise of treaty rights in the oil sands region. ACFN explained that the TRUMP would provide a regional tool to evaluate the extent of the encroachment to treaty rights caused by specific projects or by the cumulative effects of oil sands development, and would allow for the design of mitigation strategies and follow up and monitoring programs to mitigate and monitor for TLU and the exercise of treaty rights. ACFN indicated that it would take about two years to complete the development of the TRUMP.

[1813] MCFN also recommended the development of what it called a Traditional Land and Resource Use Management Plan. Other Aboriginal groups had similar suggestions and/or supported the notion of a traditional use plan for the region.

[1814] The Panel has included a recommendation that a TLU management framework be developed by Alberta in collaboration with the Government of Canada, all affected Aboriginal groups in the oil sands region and other stakeholders. The Panel also recommended that this framework be maintained and adapted over time to ensure the protection of Aboriginal land use and treaty rights in the oil sands region. The Panel notes that Shell stated that it is willing to explore the TRUMP concept with other industry participants and the Panel recommends that this take place as soon as possible.

Biodiversity

[1815] The Panel concludes that there is a potential for irreversible loss of biodiversity in the oil sands region. Many wetlands cannot be reclaimed, old-growth forests take a significant amount of time to re-establish, species at risk and other wildlife species are declining, and ecosystems are being reclaimed from lowlands to uplands. Reclamation is still the main mitigation measure for oil sands projects, yet there is still insufficient evidence to demonstrate that reclamation works or will work as intended.

[1816] Alberta requires operators to reclaim disturbed land to equivalent capability. The Panel believes that this approach does not adequately address biodiversity. For example, it is not clear how the transition from a lowland/wetland dominated ecosystem to a landscape dominated by uplands and open water would provide similar biodiversity. The Panel finds that reclamation may not work as a mitigation measure for the loss of biodiversity. The Panel understands that the *LARP* encourages timely and progressive reclamation and is in agreement that this will improve reclamation but it still may not address the loss of biodiversity. The Panel recommends to the Government of Alberta that the *LARP* biodiversity management framework take into consideration that timely and progressive reclamation may not adequately address the loss of biodiversity.

[1817] The Panel understands that in the *LARP*, Alberta has committed to develop the biodiversity management framework by the end of 2013. Due to the importance of the framework in managing biodiversity in the region and continued pressure by oil sands development, the Panel strongly urges the Government of Alberta to make all efforts to ensure the framework is completed on time. The Panel recommends that until the framework is in place, the *TEMF* be used to provide appropriate guidelines and thresholds for managing cumulative effects in the oil sands region.

Loss of Wetlands

[1818] The Panel has determined that there will be significant adverse cumulative effects on wetlands, particularly peatlands as these cannot be reclaimed. Wetlands are among the most highly productive natural systems, providing habitat for a great diversity of plants and animals. Wetlands have the capability to filter water and act as carbon storage and are intrinsically valued by Aboriginal people. The post-closure landscape of oil sands mines will be changed from lowland ecosystems to ones dominated by upland ecosystems that will negatively affect biodiversity including many species at risk and migratory birds. The Panel recommends to the

Government of Alberta that the *LARP* biodiversity management framework take into account the loss of wetlands and provide thresholds to ensure enough wetlands, including peatlands, are maintained in the Lower Athabasca Region to maintain biodiversity and protect species of cultural importance to Aboriginal people.

[1819] In the updated *Water for Life Strategy*, Alberta committed to developing and implementing a new wetlands policy for the province. *LARP* refers to this new policy. The Panel urges Alberta to complete and implement the new wetlands policy in an expeditious manner. The biodiversity management framework should reflect the intent of this policy even if the policy has not yet been implemented.

Species at Risk

[1820] There are several species at risk in the oils sands region (see appendix 10b). Some, such as the woodland caribou, have recovery strategies in place, while others do not, such as wood bison. It is important that wildlife species at risk, both federally and provincially listed, are provided special protection. *SARA* states that every person who is required to ensure that an assessment of the environmental effects of a project is conducted must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. EC has pointed out that this part of the statute applies whether the project under review occurs on federal lands or not.

[1821] The Panel understands that any identified critical habitat must be protected using provincial mechanisms because oil sands projects occur on provincial Crown land.

[1822] The Panel recommends that the Governments of Alberta and Canada work cooperatively to

- meet the goals outlined in recovery strategies for species at risk, including protecting critical habitat and meeting population recovery objectives and any other management initiatives put in place for listed species,
- complete recovery strategies as soon as possible for wood bison, Canada warbler, olive-sided flycatcher, common nighthawk, and rusty blackbird,
- complete management plans for species of special concern, and
- develop action plans to provide the mechanisms required to protect identified critical habitat as well as other actions required to protect the listed species (e.g., range plans for caribou in the Richardson Range).

[1823] The Panel believes that these strategies and plans will also serve to better inform project environmental assessments in the region.

Conservation Offsets

[1824] The Panel recognizes that there are few options available for avoiding or minimizing the adverse effects that result from clearing large areas to allow surface mining of bitumen to occur. Avoiding adverse effects generally requires sterilization of bitumen resources, while minimizing adverse effects may be difficult or impractical in the context of a large mine as it may impose too many constraints that adversely affect the safe, efficient, and economical operation of the mine. However, the Panel is concerned that without additional mitigation, significant adverse effects will occur. The Panel is concerned about the lack of mitigation that has been shown to be effective with respect to loss of wetlands and old-growth forests as these landscape types are a biodiversity hotspot for species at risk and provide important areas for Aboriginal traditional use and culturally important species' habitat. The Panel believes that conservation offsets (or allowances) provide a potentially viable mechanism for mitigating these effects without sterilizing bitumen resources or adversely affecting mine operation. The Panel notes that use of conservation offsets is the primary means used to mitigate adverse project effects respecting fish habitat as required under the federal *Fisheries Act*.

[1825] The Panel acknowledges that the *LARP* and other Alberta regulations and policies do not currently mandate the use of conservation offsets in the oil sands region. While the use of conservation offsets is contemplated under division 4 of part 3 of *ALSA*, the biodiversity management framework under the *LARP* and the new wetlands policy have not been finalized and the implementation date for these initiatives is uncertain.

[1826] The Panel notes that in addition to their use under the *Fisheries Act*, opportunities for the consideration of conservation allowances may arise through other federal processes administered under the *MBCA*, the *SARA*, the *CWA* and *CEAA, 2012* that could allow EC to consider a proposal for conservation allowances as a means of mitigating residual environmental effects. The Panel is also aware that EC has established an *Operational Framework for Use of Conservation Allowances*.

[1827] The Panel recognizes that the use of conservation offsets is a complex issue and the availability, location, effectiveness, and cost of offsets are all matters that need to be considered. In the absence of specific direction from governments on when and where conservation offsets are required, it is not surprising that project proponents are reluctant to commit to the use of them. However, given that there are few options available for avoiding or minimizing the adverse effects resulting from large surface mines, conservation offsets may be necessary.

[1828] The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address the significant adverse project effects to wetlands, wetland-reliant species at risk, migratory birds that are wetland-reliant or species at risk, and biodiversity and the significant adverse cumulative effects to wetlands, traditional plant potential areas, old-growth forests, wetland-reliant species at risk and migratory birds, old-growth forest-reliant species at risk and migratory birds, biodiversity and Aboriginal traditional use. In considering the need for conservation offsets, Alberta and Canada should have regard for proposed environmental objectives for the Athabasca oil sands region and current and proposed policy frameworks, including but not limited to the proposed biodiversity management framework under the *LARP*, Alberta's proposed new wetlands policy, and EC's *Operational Framework for Use of Conservation Allowances*. Integration of Aboriginal traditional use needs should be part of the implementation process. Where possible, the requirements for conservation offsets should be formalized through permitting or approval conditions.

Air Quality

[1829] Air emissions are regulated by Alberta. Each proponent must show at the application stage that its project will not exceed regulatory thresholds and if thresholds are exceeded during actual operations, enforcement may be required. The Panel finds this to be satisfactory on a project-by-project basis. However, the Panel notes that evidence provided during this proceeding indicated that if all currently planned and approved projects are built, ambient air quality guidelines may be exceeded in the future for some compounds. The Panel notes that the *LARP* provides a management framework for air quality that has been approved for implementation. The *LARP* indicates that these frameworks will establish ambient environmental limits and triggers for NO_2 and SO_2. The Panel believes that the *LARP* air quality management framework is an appropriate way to manage regional air quality and will be able to prevent regional exceedances. The Panel stresses the importance of the air quality framework as being key to limiting the cumulative effects on the region's airshed. The Panel recommends that the Government of Alberta consider establishing ambient environmental limits and triggers for other air quality compounds in the future as a part of *LARP*, in addition to SO_2 and NO_2.

[1830] The Panel notes that Shell provided evidence indicating that acrolein emissions will exceed health-based guidelines. The Panel further notes that Shell proposed no mitigation measures for reducing acrolein emissions because Shell considered that its contribution to acrolein would be negligible. The Panel notes that Alberta has not developed ambient air quality objectives for acrolein but is in the process of doing so.

[1831] The recent studies by Dr. Schindler, EC and others raise potential concerns about the impacts of PAH and metals deposition on the surrounding environment and seem to point to upgraders as the key source and concern. While the Panel did not find significant adverse cumulative effects resulting from the Project, this new data suggest the need for more study, including a more detailed review of the impacts of regional cumulative emissions of these compounds.

Water Quality / Quantity

[1832] The Panel heard from Aboriginal groups and other interested parties that were concerned about water withdrawals from the Athabasca River. The Panel noted concerns about the navigability of the river and reduced spring flooding in the PAD. The Panel notes that these changes are due to several causes, not necessarily related to development of the oil sands. The Panel understands that there is concern regarding a minimum base flow requirement for the river and that there is disagreement amongst stakeholders regarding the minimum flow requirements for the Athabasca River. The Panel is aware that Phase 2 of the *Lower Athabasca River Water Management Framework* is currently being developed. The Panel recommends an EBF be set as part of this framework, taking into account stakeholder needs. Recognizing the important implications flowing from this framework, the Panel urges the Governments of Canada and Alberta to conclude the development process and implement this framework expeditiously.

[1833] The Panel is aware of the surface water and groundwater quality concerns raised by interested parties. The Panel recognizes that the federal and provincial governments have taken steps to establish a *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, a comprehensive approach to future monitoring that includes water quality. The Panel understands that some monitoring activity has already been initiated with industry funding and encourages the governments to place a high priority on early implementation of the full monitoring program.

[1834] The Panel notes Alberta's commitment through the *LARP* to implement the surface water quality management framework and to complete and implement the groundwater management framework. The Panel recommends that the Government of Alberta complete and implement these as quickly as possible to ensure the quality of water in the region is within the regulatory aquatic life guideline values. The Panel notes that the *LARP* indicates that the information will be reported on and recommends that this information be provided to the public. The Panel stresses the importance of the water quality frameworks as being key to limiting the cumulative effects on the region's surface water and groundwater quality.

Fish and Fish Habitat

[1835] The Panel notes that NNLPs have been used to mitigate project-specific effects for many oil sands projects. The Panel further notes that DFO stated there is still uncertainty regarding cumulative effects on fish and fish habitat. The *TEMF* indicates that the index of native fish integrity is currently in the red condition, meaning it is more than 20 per cent below the NRV, and it is forecasted to decline further in the future. The Panel found that Shell's NNLP did not specifically describe how cumulative effects are incorporated into planning.

[1836] DFO asked the Panel to recommend that Shell conduct a CEA on downstream fish habitats, including middle reaches of the Muskeg River, Shell's JPM, Imperial's KOSP fish habitat offsets, Kearl Lake, the lower reaches of the Muskeg River, and the Athabasca River, including the PAD. DFO stated that it believed that it was possible for an individual oil sands operator to undertake this assessment but suggested an alternative would be to conduct this assessment in cooperation with other oil sands operators and regional stakeholders.

[1837] The Panel is of the view that such a study should not be undertaken by an individual proponent. The Panel recommends that a regional study be conducted by DFO in cooperation with other government agencies and stakeholders, including Aboriginal groups, to determine the cumulative effects to fish health, abundance, and habitat in the oil sands region. This study should take into account the effects of water quantity and quality on fish health and habitat as well as changes to rivers and streams and the use of compensation lakes to replace fish habitat. The study should determine how long it takes for fish to establish in a compensation lake and how long before the fish can be safely consumed by humans and wildlife. Fish biodiversity should also be assessed to determine changes to biodiversity that occur as a result of removing or changing rivers and streams and replacing that habitat with lakes.

Regional Monitoring

[1838]The Panel believes that regional strategic monitoring plans are required for the oil sands region. The monitoring plans are required to assess observed levels of compounds against thresholds established in management frameworks. The Panel notes that Alberta and Canada have established the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* to provide a monitoring program for the oil sands to ensure environmentally responsible development of the oil sands resource. The Panel notes that funding has not yet been finalized for this plan. The Panel strongly urges that this be provided as soon as possible so that this plan can be implemented in a timely manner.

[1839] This plan's monitoring data will provide information on air and water quality, aquatic ecosystem health, wildlife toxicology, and much more. Interested parties raised concerns regarding the above issues during the review process. The Panel recognizes the commitment from Alberta and Canada to implement this plan and provide for a transparent process. The Panel encourages governments to work with all stakeholders and Aboriginal groups to ensure this plan is effective. The Panel believes that information obtained during the monitoring must be made available to the general public in an understandable fashion. The Panel encourages the use of adaptive management at both the project and regional levels if monitoring indicates thresholds are being approached or exceeded. Adaptive management plans should be developed as soon as possible so that they can be used without delay if and when needed.

Socioeconomic Impacts

[1840] The Panel received evidence from the RMWB that community development continues to be hampered by an inability to address many of the region's socioeconomic issues, which it attributed primarily to the lack of timely decisions and actions and an uncoordinated approach by provincial government departments.

[1841] The Panel notes the RMWB's view that there is a lack of an integrated process to bring federal, provincial, and municipal governments together with industry to solve problems, including land release. The Panel recommends that the Governments of Canada and Alberta obtain further information from RMWB about this concern and consider how such an integrated process could be developed. In that respect, the Panel notes, for example, the excellent work that Canada and Alberta have done together on monitoring.

[1842] The Panel notes that the RMWB considered the lack of timely land availability as its most important problem because of the inability to transfer land to private developers of housing and for industrial and commercial uses. The Panel accepts that a lack of timely decisions and actions by the provincial government about the release of land is having detrimental socioeconomic impacts on the region. In particular, the Panel concludes that a shortage of land for development results in higher prices than need to exist. The Panel urges the Government of Alberta to address the RMWB's need for developable land on a priority basis. In addition, the Panel recommends that the Government of Alberta implement a coherent and functioning land release policy as recommended by the RMWB.

[1843] With respect to the need for a coordinated approach to additional transportation infrastructure, the Panel believes that this matter has merit in more than one respect. The Panel accepts that there may be coordination problems between the transportation authority and the land release authority, a situation the Panel sees as problematic. Accordingly, the Panel recommends that the Government of Alberta consider the matter of coordination problems and identify ways to provide greater coordination between and among its ministries.

[1844] Further on transportation, the Panel heard from the RMWB that the proposal to build an eastern bypass would alleviate traffic safety and congestion concerns in Fort McMurray and would also allow for heavy trucks to ship south to connect with railways. It said that the decision had been made to proceed with the bypass but that the coordination required has not been occurring. The Panel recommends that the Government of Alberta determine what is needed to proceed with the bypass protocol.

[1845] With respect to the approval process for residential camps at the provincial level, the Panel believes there are opportunities for greater coordination between the province and the RMWB. The Panel recommends that the province ensure that RMWB concerns are addressed in the camp approval process, to advise the municipality of approvals issued, and to address the RMWB's concerns respecting compliance with the terms of such approvals.

Dated in Calgary, Alberta, on July 9, 2013.

ALBERTA ENERGY REGULATOR

CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY

<original signed by>

J. D. Dilay, P.Eng.
Panel Chair

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Panel member

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L. J. Cooke
Panel member

APPENDIX 1 HEARING PARTICIPANTS

Principals and Representatives (Abbreviations used in report)	Witnesses
Shell Canada Energy (Shell)	Linda Havers
Shawn Denstedt, Q.C.	Mitchel Goodjohn
Sander Duncanson	Jason Plamondon
Dan Kolenick	David Schaaf
	Bart Koppe
	Candace Bell
	Martin Jalkotzy
	Getu Biftu
	Jerry Vandenberg
	Joao Kupper
	Kasey Clipperton
	Mark Sawyer
	Michael Margerum
	Muffay Fitch
	Rosemary Bloise
	Colin Middleton
	Brock Simons
	Peter Chapman
	Linda Jefferson
	Wayne Speller
	Bill Kovach
	Darrel Martindale
	John Broadhust
	Jeff Roberts
	Malcolm Mayes
Athasbasca Chipewyan First Nation (ACFN)	Chief Allan Adam
Eamon Murphy	Elder Pat Marcel
Jenny Biem	Elder Rene Bruno
	Elder Charlie Voyageur
	Raymond Cardinal
	Marvin L'Hommecourt
	Leslie Laviolette
	Jonathan Bruno
	Kim Marcel
	Beatrice Deranger
	Lisa King
	Nicole Nicholls
	Doreen Somers
	Dr. Paul Jones
	Dr. Patt Larcombe
	Dr. Pat McCormack

	Dr. Carver Dr. Craig Candler Dr. Petr Komers Dr. Sheri Gutsell Sarah Hechtenthal Alistair MacDonald Bruce MacLean
Attorney General of Canada (Canada) Kirk Lambrecht, Q.C. James Elford	Fisheries and Oceans Canada (DFO) Brian Makowecki Marek Janowicz Court D. Berryman
	Environment Canada (EC) Cheryl Baraniecki Rob Bennett Barrie Bonsal William Booty Patricia Chambers Dave Fox Heather Morrison Samantha Song Doug Spry Stephen Virc Corinna Watt Richard Wiacek Greg Bickerton
	Natural Resources Canada (NRCAN) Shelley Ball Kim Kasperski Miroslav Nastev Baolin Wang
	Transport Canada (TC) Dale Kirkland Shannon Vollema
Donna Deranger	Donna Deranger
Fort McKay First Nation and Fort McKay Métis Community Association (Fort McKay) Karin Buss	
Fort McMurray #468 First Nation Rangi Jeerakathil	
John Malcolm, the Non-Status Fort McMurray/Fort McKay First Nation and the	John Malcolm Maureen Cardinal

Clearwater River Paul Cree Band #175 (the Bands) Anna Johnston	Celina Malcolm
Métis Nation of Alberta Region 1 and the individuals and groups named together with Region 1 Debbie Bishop Cynthia Bertolin	Gabe Bourke Barb Hermansen John Grant Mike Guertin Fred (Jumbo) Fraser Diane Scoville Bill Loutitt Harvey Sykes Joe Hamelin John Fraser Peter Fortna Clem Chartier
Mikisew Cree First Nation (MCFN) Don Mallon, Q.C. Daniela O'Callaghan	
Minister of Justice and Attorney General of Alberta (Alberta) Thomas Rothwell	
Oil Sands Environmental Coalition (OSEC) Karin Buss Melissa Gorrie	Marc Huot Simon Dyer Carolyn Campbell Jennifer Grant Dr. Glenn Miller Dr. David Schindler
Regional Municipality of Wood Buffalo (RMWB) Ray Purdy, Q.C. Katherine Morianos Tore Purdy	Glen Laubenstein Michael Evans Gary Gordon Darryl Howery
Sierra Club Prairie Chelsea Flook	Chelsea Flook
Dr. Keith Stewart	Dr. Keith Stewart
Syncrude Canada Ltd. (Syncrude) Bernard Roth Sheliza Ladha	
Elder Mary Tourangeau	Elder Mary Tourangeau
Total E&P Canada Ltd. (Total)	

Kellie Johnston	
Clinton Westman	
Dr. Anna Zalik and Osume Osuoka	Dr. Anna Zalik
Canadian Environmental Assessment Agency Charles Birchall, Counsel Jill Adams Deborah Austin Daniel Martineau Jean-Pierre Thonney Courtney Trevis	
Energy Resources Conservation Board staff Gary Perkins, Counsel Meighan LaCasse, Counsel Robert Mueller, Counsel Paul Aguas Michael Bevan Amanda Black Krista Boychuk Afshan Mahmood Yetimgeta Mihiretu Gladys Onovwiona Don South Erin Tough Steven van Lingen Tara Wang	

APPENDIX 2 ABBREVIATIONS USED IN THIS REPORT

Acronym/Abbreviation	Definition
$\mu g/m^3$	Micrograms per cubic metre
AAAQO	*Alberta Ambient Air Quality Objectives*
ABF	Aboriginal Base Flow
ABMI	Alberta Biodiversity Monitoring Institute
ACFN	Athabasca Chipewyan First Nation
ADTT	Average daily two-way traffic
AEF	Aboriginal Extreme Flow
AENV	Alberta Environment
AER	Alberta Energy Regulator
AESRD	Alberta Environment and Sustainable Resource Development
Alberta	Attorney General of Alberta
ALSA	*Alberta Land Stewardship Act*
APJA	*Administrative Procedures and Jurisdiction Act*
AVI	Alberta Vegetation Index
BML	Base Mine Lake
Canada	Attorney General of Canada
CAPP	Canadian Association of Petroleum Producers
CBD	Convention on Biological Diversity
CCME	Canadian Council of Ministers of the Environment
CDA	Canadian Dam Association
CEA	Cumulative effects assessment
CEAA	*Canadian Environmental Assessment Act*
CEAA, 2012	*Canadian Environmental Assessment Act, 2012*
CEAA	Canadian Environmental Assessment Agency
CEB	Chronic Effects Benchmark
CEMA	Cumulative Environmental Management Association
CHA Baseline	Cultural Heritage Assessment Baseline
Clearwater Band	Clearwater River Paul Cree #175 Band
cm	Centimetres
CNRL	Canadian Natural Resources Limited
CO_2	Carbon dioxide
CO_2e/bbl	CO_2 equivalent per barrel of bitumen produced
CONRAD	Canadian Oil Sands Network for Research and Development
COSIA	Canada's Oil Sands Innovation Alliance
CSE	Culturally Significant Ecosystems
CWA	*Canadian Wildlife Act*
dBA	Decibel A
DDA	Dedicated Disposal Areas
DFO	Department of Fisheries and Oceans Canada
Directive 038	*AER Directive 038: Noise Control*

Acronym/Abbreviation	Definition
Directive 060	*AER Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting*
Directive 074	*AER Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes*
Directive 082	*AER Directive 082: Operating Criteria: Resource Recovery Requirements for Oil Sands Mine and Processing Plant Operations*
DO	Dissolved Oxygen
EBF	Ecosystem Base Flow
EC	Environment Canada
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPEA	*Environmental Protection and Enhancement Act*
EPL	End Pit Lake
EPLGD	End Pit Lake Guidance Document
ERCA	*Energy Resources Conservation Act*
ERCB	Energy Resources Conservation Board
ESRD	Alberta Environment and Sustainable Resource Development
ETDA	External Tailings Disposal Area
ETF	External Tailings Facility
EUB	Alberta Energy and Utilities Board
FDSA	Focused Disturbance Study Area
FHEC	Fort Hills Energy Corporation
FHOSP	Fort Hill Oil Sands Project
FMFN	Fort McKay First Nation
FMMCA	Fort McKay Métis Community Association
FMMFN #468	Fort McMurray #468 First Nation
FMSA	*Fort McKay Specific Assessment*
Fort McKay	Fort McKay First Nation and FMMCA/Métis Local #63
FTSA	Forty Township Study Area
GDP	Gross domestic product
GHG	Greenhouse Gas Emissions
GIC	Governor in Council
ha	Hectares
HADD	Harmful alteration, disruption, and destruction
HC	Health Canada
HHRA	Human Health Risk Assessment
HIS	Habitat suitability index
HRIA	Historical Resources Impact Assessment
ID	Interim Directive
ID 2001-7	*AER ID 2001-7: Operating Criteria: Resource Recovery Requirements for Oil Sands Mine and Processing Plant Sites*

Acronym/Abbreviation	Definition
IKLU Report	*Integrated Knowledge and Land Use Report and Assessment for Shell Canada's Proposed Jackpine Mine and Pierre River Mine*
Imperial	Imperial Oil Resources Ventures Limited
INAC	Indian and Northern Affairs Canada
IPCC3	Intergovernmental Panel on Climate Change 3rd Assessment
IPCC4	Intergovernmental Panel on Climate Change 4th Assessment
IRC	Industry Relations Corporation
IRP	Integrated Resource Plan
JPM	Jackpine Mine
kg	Kilogram
KIR	Key Indicator Resource
km	Kilometres
KOSP	Kearl Oil Sands Project
Larcombe Report	*A Narrative of Encroachment Experienced by the Athabasca Chipewyan First Nation*
LARP	*Lower Athabasca Regional Plan*
LSA	Local Study Area
LUF	Land use framework
m	Metre
m^3/d	Cubic metres per day
m^3/s	Cubic metres per second
MAC	Mining Association of Canada
Mbbl	Million barrels
MBCA	*Migratory Birds Convention Act, 1994*
MCFN	Mikisew Cree First Nation
MFSP	Mine Financial Security Program
MFT	Mature Fine Tailings
mg/l	Milligram per litre
MLS	multiple listing service
MLWC	McClelland Lake Wetlands Complex
Mm^3	Million cubic metres
MNA	Métis Nation of Alberta
MOU	Memorandum of understanding
MRDA	Muskeg River Diversion Alternative
MRDC	Muskeg River Diversion Channel
MRM	Muskeg River Mine Project
Mt CO_2e/yr	Million tonnes in CO_2 equivalent per year
NIA	Noise Impact Assessment
NNLP	No Net Loss Plan
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxide

Acronym/Abbreviation	Definition
NPRI	National Pollutant Release Inventory
NQCL	Notice of questions of constitutional Law
NRCan	Natural Resources Canada
NRV	Natural Range of Variability
NSFMFM	Non-Status Fort McMurray and Fort McKay First Nation
NST	Non-Segregating Tailings
NWPA	*Navigable Waters Protection Act*
OBDA	Overburden disposal area
OH&S	Occupational Health & Safety
OHSA	*Alberta Occupational Health and Safety Act*
OMS	Operation, Maintenance and Surveillance
OSCA	*Oil Sands Conservation Act*
OSCR	*Oil Sands Conservation Regulation*
OSEC	Oil Sands Environmental Coalition
OSTC	Oil Sands Tailings Consortium
P2FC	Phase 2 Framework Committee
PAD	Peace-Athasbasca Delta
PAH	Polycyclic Aromatic Hydrocarbon
PAI	Potential Acid Input
Parks Canada	Parks Canada Agency
PAW	Process Affected Water
PCA	Pleistocene Channel Aquifer
PDC	Planned development case
Phase 1	Jackpine Mine – Phase 1
PIC	Preindustrial case
PM2.5	Fine particulate matter
PRM	Pierre River Mine Project
PVA	Population Viability Analysis
QUEST	Quality Urban Energy Systems of Tomorrow
RAMP	Regional Aquatics Monitoring Program
RDSA	Regional Disturbance Study Area
REDA	*Responsible Energy Development Act*
RFMA	Registered fur management areas
RMS	Reclamation Material Stockpile
RMWB	Regional Municipality of Wood Buffalo
RSA	Regional Study Area
SAGD	Steam-assisted gravity drainage
SARA	Species at Risk Act
SEIA	Socioeconomic impact assessment
Shell	Shell Canada Energy
SIR	Supplemental Information Request

Acronym/Abbreviation	Definition
SO_2	Sulphur Dioxide
SO_X	Sulfur Oxide
Syncrude	Syncrude Canada Limited
TC	Transport Canada
TDS	Total Dissolved Solids
TEK	Traditional Ecological Knowledge
TEMF	Terrestrial ecosystem management framework
The 2006 Report	*Nistawayaw, Where Three Rivers Meet, Fort McMurray #468 First Nation, Traditional Land Use Study (2006)*
the Agency	Canadian Environmental Assessment Agency
the Agreement	Agreement to Establish a Joint Review Panel
the Panel	Joint Review Panel
the Project	Jackpine Mine Expansion Project
TK	Traditional Knowledge
TLL Report	*Cumulative Impacts to FMMFN #468 Traditional Lands and Lifeways*
TLRUMP	Traditional Land and Resource Use Management Plan
TLU	Traditional Land Use
TLU-LSA	Local study area for traditional land use
TLU-RSA	Regional study areas for the TLU assessment
TOR	Terms of reference
Total	Total E&P Canada Limited
TRUMP	Traditional Resource Use Management Plan
TSRU	Tailings Solvent Recovery Unit
TSS	Total Suspended Solids
TT	Thickened Tailings
VOC	volatile organic compound
WBEA	Wood Buffalo Environmental Association
wt%	Per cent bitumen by weight

APPENDIX 3 JOINT PANEL AGREEMENT

AGREEMENT
To Establish a Joint Review Panel for the Jackpine Mine Expansion Project

Between
The Minister of the Environment, Canada

- and -

The Energy Resources Conservation Board, Alberta

PREAMBLE

WHEREAS the Energy Resources Conservation Board (the ERCB) has statutory responsibilities pursuant to the *Energy Resources Conservation Act*; and

WHEREAS the Minister of the Environment, Canada (the Federal Minister of the Environment) has statutory responsibilities pursuant to the *Canadian Environmental Assessment Act*; and

WHEREAS the Jackpine Mine Expansion Project (the project) requires a public hearing and approvals from the ERCB pursuant to the *Energy Resources Conservation Act*, and the *Oil Sands Conservation Act*, and is subject to an assessment under the *Canadian Environmental Assessment Act*; and

WHEREAS the Canadian Environmental Assessment Agency (the Agency) has requested, in accordance with section 25 of the *Canadian Environmental Assessment Act*, that the Federal Minister of the Environment refer the project to a review panel; and

WHEREAS the Federal Minister of the Environment has referred the project to a review panel in accordance with section 29 of the *Canadian Environmental Assessment Act*; and

WHEREAS the Government of the Province of Alberta and the Government of Canada established a framework for conducting joint review panels through the *Canada-Alberta Agreement on Environmental Assessment Cooperation (2005)* signed on May 17, 2005; and

WHEREAS the ERCB and the Federal Minister of the Environment have determined that a joint review of the project will ensure that the project is evaluated according to the spirit and requirements of their respective authorities while avoiding unnecessary duplication, delays and confusion that could arise from individual reviews by each government or the ERCB; and

WHEREAS the ERCB and the Federal Minister of the Environment have determined that a joint review of the project should be conducted in a manner consistent with the provisions of Appendix 2 of the *Canada-Alberta Agreement on Environmental Assessment Cooperation (2005)*; and

WHEREAS the Federal Minister of the Environment has determined that pursuant to subsection 40(2) of the *Canadian Environmental Assessment Act* a joint review panel should be established to consider the project; and

WHEREAS the ERCB has determined that pursuant to section 22 of the *Energy Resources Conservation Act* a joint review panel cooperative proceeding should be established and that the project should be considered in a cooperative proceeding by the ERCB and the Agency;

THEREFORE, the ERCB and the Federal Minister of the Environment hereby establish a joint review panel for the project in accordance with the provisions of this Agreement and the Terms of Reference attached as an Appendix to this Agreement.

1. Definitions

For the purpose of this Agreement and of the Appendix attached to it,

"**Agency**" means the Canadian Environmental Assessment Agency established by the *Canadian Environmental Assessment Act*.

"**environment**" means the components of the Earth, and includes

a. land, water and air, including all layers of the atmosphere;
b. all organic and inorganic matter and living organisms; and
c. the interacting natural systems that include components referred to in a. and b.

"**environmental effect**" means, in respect of the project,

a. any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residence of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
b. any effect of any change referred to in paragraph a. on
    i. health and socio-economic conditions
    ii. physical and cultural heritage
    iii. the current use of lands and resources for traditional purposes by Aboriginal persons, or
    iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
c. any change to the project that may be caused by the environment

whether any such change or effect occurs within or outside Canada.

"**federal authority**" refers to such an authority as defined in the *Canadian Environmental Assessment Act*.

"**report**" means the document produced by the Joint Review Panel, which contains decisions pursuant to the *Energy Resources Conservation Act* or the *Oil Sands Conservation Act*, and the Joint Review Panel's rationale, conclusions and recommendations relating to the environmental assessment of the project, including any mitigation measures and follow-up program pursuant to the *Canadian Environmental Assessment Act*.

"follow-up program" means a program for

a. verifying the accuracy of the environmental assessment of the project, and

b. determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.

"**Joint Review Panel**" refers to the Joint Review Panel established by the ERCB and the Federal Minister of the Environment through this Agreement.

"**mitigation**" means, in respect of the project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

"**parties**" means the signatories to this Agreement.

"**proponent**" has the meaning provided in section 2 of the *Canadian Environmental Assessment Act*.

"**public registry**" means a repository to facilitate public access to the records relating to the environmental assessment of the project in accordance with section 55 of the *Canadian Environmental Assessment Act*.

"**responsible authority**" refers to such an authority as defined in the *Canadian Environmental Assessment Act*.

2. Establishment of the Joint Review Panel

2.1 A process is hereby established to create a Joint Review Panel, pursuant to section 22 of the *Energy Resources Conservation Act* with the authorization of the Lieutenant Governor in Council of Alberta, and sections 40, 41 and 42 of the Canadian Environmental Assessment Act, for the purposes of the joint review of the project.

2.2 The ERCB and the Agency will make arrangements to coordinate the announcements of a joint review of the project by both Alberta and Canada.

3. Constitution of the Joint Review Panel

3.1 The Joint Review Panel will consist of three members. Two members, including the Joint Review Panel Chair, will be appointed by the Chair of the ERCB with the approval of the Federal Minister of the Environment. The third Joint Review Panel member will be appointed by the Federal Minister of the Environment in accordance with article 3.2 of this Agreement.

3.2 The Federal Minister of the Environment will select the third Joint Review Panel member and recommend the selected candidate as an individual who may serve as a potential acting member of the ERCB. If acceptable to the Lieutenant Governor in Council of Alberta and the Chairman of the ERCB, the Lieutenant Governor in Council of Alberta will nominate this candidate to serve as an acting member of the ERCB and the Chairman of the ERCB will appoint this candidate as a member of the Joint Review Panel. The selected candidate will also be appointed by the Federal Minister of the Environment as a member of the Joint Review Panel.

3.3 The Joint Review Panel members shall be unbiased and free from any conflict of interest relative to the project and are to have knowledge or experience relevant to the anticipated environmental effects of the project.

4. Conduct of Assessment by the Joint Review Panel

4.1 The Joint Review Panel shall conduct its review in a manner that discharges the responsibilities of the ERCB under the *Energy Resources Conservation Act*.

4.2 The Joint Review Panel shall conduct its review in a manner that discharges the requirements set out in the *Canadian Environmental Assessment Act* and in the Terms of Reference attached as an Appendix to this Agreement and that were fixed and approved by the Federal Minister of the Environment and the ERCB.

4.3 The Joint Review Panel shall have all the powers and duties of a panel described in section 35 of the *Canadian Environmental Assessment Act* and of a division of the ERCB described in section 8 of the *Energy Resources Conservation Act*.

4.4 The Joint Review Panel hearing shall be public and the review will provide opportunities for timely and meaningful participation by the public, including Aboriginal persons and groups. Hearing participants will not be required to satisfy the test under subsection 26(2) of the *Energy Resources Conservation Act*. The Joint Review Panel shall conduct its hearing in accordance with the ERCB's *Rules of Practice*. The Joint Review Panel will, however, attempt to make the review process as accessible as reasonably possible for individuals or groups who are not represented by legal counsel or who may lack experience with the quasi-judicial nature of the hearing process.

4.5 A majority of the Joint Review Panel members constitutes a quorum for the purposes of the environmental assessment to be conducted by the Joint Review Panel. When a hearing, public meeting, or other activity is conducted by the Joint Review Panel and a member of the Joint Review Panel for any reason does not attend on any day or part of a day, the other members who are sitting at the hearing, public meeting or other activity may continue as fully and effectively as though the absent member was present.

5. Secretariat

5.1 Administrative, technical, and procedural support requested by the Joint Review Panel shall be provided by a Secretariat, which shall be the joint responsibility of the ERCB and the Agency.

5.2 The Secretariat will report to the Joint Review Panel and will be structured so as to allow the Joint Review Panel to conduct its review in an efficient and cost-effective manner.

5.3 The ERCB will provide its offices for the conduct of the activities of the Joint Review Panel and the Secretariat.

6. Aboriginal Rights and Interests

6.1 The Joint Review Panel may receive information from Aboriginal groups related to the nature and scope of asserted or established Aboriginal and treaty rights in the area of the project, as well as information on the potential adverse environmental effects that the project may have on asserted or established Aboriginal and treaty rights. The Joint Review Panel may also receive information provided in this regard by other participants, federal authorities or government, and provincial departments or government.

6.2 The Joint Review Panel shall reference in its report:

a. the information provided by participants regarding the manner in which the project may adversely affect asserted or established Aboriginal and treaty rights; and

b. the information provided by participants regarding the strength of claim in respect of Aboriginal and treaty rights asserted by a participant, including information about the location, extent, bases and exercise of those asserted Aboriginal and treaty rights in the area of the project.

For the purposes of its report, the Joint Review Panel shall document claims of Aboriginal and treaty rights as presented by participants and consider the effects of the project on the Aboriginal and treaty rights so presented. The Joint Review Panel may use this information to make recommendations that relate to the manner in which the project may adversely affect the Aboriginal and treaty rights asserted by participants.

6.3 Notwithstanding articles 6.1 and 6.2, the Joint Review Panel is not required by this agreement to make any determinations as to:

a. the validity of Aboriginal or treaty rights asserted by a participant or the strength of such claims;
b. the scope of the Crown's duty to consult an Aboriginal group; or
c. whether the Crown has met its respective duties to consult or accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act, 1982.*

6.4 Nothing in this article 6 limits the application of Part 2 of the *Administrative Procedures and Jurisdiction Act* to the ERCB, and the Joint Review Panel (in its capacity as a division of the ERCB) remains at all times subject to the requirements of, and entitled to exercise the powers under Part 2 of the *Administrative Procedures and Jurisdiction Act,* including but not limited to section 13 thereof.

7. Record of Joint Review and Report

7.1 A public registry will be maintained by the Secretariat during the course of the joint review in a manner that provides for convenient public access, and for the purposes of compliance with sections 55 to 55.5 of the *Canadian Environmental Assessment Act.*

7.2 Subject to subsections 35(3), (4), and (4.1) and section 55.5 of the *Canadian Environmental Assessment Act*, the public registry will include all submissions, correspondence, hearing transcripts, exhibits and other information received by the Joint Review Panel and all public information produced by the Joint Review Panel relating to the review of the project.

7.3 On completion of the assessment of the project, the Joint Review Panel shall prepare a report. The report shall include an executive summary in both official languages. The report will set out the rationale, conclusions and recommendations of the Joint Review Panel relating to the environmental assessment of the project, including any mitigation measures and follow-up program, and a summary of comments received from the public, including Aboriginal persons and groups. The report will be conveyed to the Government of Alberta and the Federal Minister of the Environment within 90 days of the close of record. Simultaneously, the report will be published and made available to the public by the Joint Review Panel.

7.4 After the report is submitted, the responsibility for the maintenance of the public registry will be transferred to the responsible authority. The ERCB will continue to maintain records of the proceedings and the report in accordance with its normal practices and procedures.

7.5 The Agency will be responsible for the translation of key documents prepared by the Joint Review Panel, including public notifications and releases and the report, into both of the official languages of Canada. The Agency will use all reasonable efforts to expedite the translation of the report.

8. Other Government Departments

8.1 The Joint Review Panel may request federal authorities and provincial authorities having specialized information or knowledge with respect to the project to make that information or knowledge available to the Joint Review Panel in an acceptable manner.

8.2 Nothing in this Agreement will restrict the participation by way of submission to the Joint Review Panel by other federal or provincial government departments or bodies, subject to article 8.1, above, subsection 12(3) of the *Canadian Environmental Assessment Act* and the ERCB Rules of Practice.

9. Participant Funding

9.1 Decisions regarding participant funding by the Agency under the federal Participant Funding Program, and decisions on local intervener funding by the ERCB as provided for in the *Energy Resources Conservation Act*, ERCB Rules of Practice and the ERCB's Directive 31: Guidelines for Energy Proceeding Cost Claims will, to the extent practicable, take into account decisions of the other party.

10. Cost Sharing

10.1 The ERCB, as lead party, will develop a budget estimate of expenses agreeable to both parties prior to initiation of the Joint Review Panel activities.

10.2 The costs of the joint review will be apportioned between the ERCB and the Agency in the manner set out in articles 10.3, 10.4 and 10.5.

10.3 The ERCB will be solely responsible for the following costs:

- salaries and benefits of the Joint Review Panel Chairman and the member of the Joint Review Panel not appointed in accordance with article 3.2; and
- salaries and benefits of ERCB staff involved in the joint review.

10.4 The Agency will be solely responsible for the following costs:

- per diems of the Joint Review Panel member appointed in accordance with article 3.2;
- salaries and benefits of Agency staff involved in the joint review;
- all costs associated with the Agency's legal counsel for the proceeding;
- all costs associated with the federal Participant Funding Program;
- translation of records and documents into the official languages of Canada other than translation required as outlined in article 10.5 of this Agreement; and
- costs associated with the public registry established pursuant to section 55.1 of the *Canadian Environmental Assessment Act*.

10.5 The ERCB and the Agency agree to share equally all those costs listed below, incurred as part of the joint review from the signing of this Agreement to the date the report is issued by the Joint Review Panel. The shareable costs are as follows:

- travel-related expenses associated with the review incurred by Joint Review Panel members and Joint Review Panel Secretariat staff;
- per diems and associated expenses of independent/non-government expert consultants, analysts and communications specialists retained by the Secretariat;
- language translation and interpretation services and facilities related to the evidence of applicants, participants and local interveners as required by the Joint Review Panel, but not including translation service referred to in article 7.5 of this Agreement;
- printing of any reports and documents distributed by the Joint Review Panel necessary for the Joint Review Panel's work;
- the publication of notices and releases;
- photocopying, including the reproduction of documents contained in the public registry, and postage related to the joint review;
- court reporting and transcripts as required by the Joint Review Panel;
- rental of hearing, public meeting and public information office facilities and equipment;

- audio and audio-visual services at the hearing and public meetings; and
- miscellaneous expenditures up to a maximum of five percent (5%) of the total budget for the joint review.

10.6 The Agency may only be responsible for contributing to shareable costs within the allowable limits of Treasury Board Secretariat directives.

10.7 Shareable costs of the joint review as detailed in article 10.5 will be incurred at the sole discretion of the Joint Review Panel with due regard to economy and efficiency.

10.8 All expenses not listed above will need prior approval of both parties if they are to be equally shared.

11. Invoicing

11.1 The ERCB will be responsible for advancing funds for the payment of the shareable costs and will invoice the Agency for the amounts owed under this Agreement, except for travel-related expenses of the Agency's staff which will be advanced by the Agency. In the event that the Agency is required to advance shareable funds directly, it will advance funds for payment and will invoice the ERCB as determined under this Agreement.

11.2 The invoicing will be done either at the end of each month or quarterly at the discretion of the ERCB. The invoice will cover all shareable costs paid by the ERCB.

11.3 Each invoice will be accompanied by a summary description of the shareable costs actually incurred and paid for the period covered by the invoice, in a form satisfactory to both parties and will be approved by an official acceptable to both parties. Detailed information about incurred costs will be retained and made available to either Party upon request.

11.4 Subject to compliance with the above requirements, the Agency will pay to the ERCB the amount stated as being owed to it in the invoice within sixty (60) days of having received such invoice.

11.5 With respect to invoices covering the last period of any fiscal year (ending March 31), and the last invoice to be produced for the Joint Review Panel, each Party may review and deduct from the invoice, any incurred shareable costs that have not been previously recovered, so as to determine a net transfer of shared costs from one party to another. The payment will be made within thirty (30) days of having received such invoice. An accounting of the shared expenses incurred by the Agency will be sent with the year-end and final payments, or earlier as may be requested by the ERCB.

12. Audit

12.1 Subject to this Agreement, both parties will keep open to audit and inspection by the Agency or the ERCB, or their duly authorized representative, all invoices, receipts, vouchers and documents of any nature or kind whatsoever that have been relied on by either of the two parties to calculate the shared cost of conducting the public review.

12.2 The Party exercising its option to audit will be responsible for the cost of the audit.

12.3 Where an audit conducted by either Party in connection with this Agreement reveals discrepancies regarding the amount billed to the Agency, and where prompt resolution between the parties is unattainable, an independent auditor acceptable to both parties will resolve the issue.

13. Amending this Agreement

13.1 The terms and provisions of this Agreement may be amended by written memorandum executed by both the Federal Minister of the Environment and the Chairman of the ERCB. Subject to section 27 of the *Canadian Environmental Assessment Act*, upon completion of the joint review, this Agreement may be terminated at any time by an exchange of letters signed by both parties.

14. Signatures

WHEREAS the parties hereto have put their signatures

The Honourable Peter Kent
Minister of the Environment

Date SEP 01 2011

Dan McFadyen, P.Eng.
Chairman
Energy Resources Conservation Board

Date Sept. 13 / 11

Appendix
Terms of Reference

Part I - Scope of Project

Shell Canada Limited is requesting to amend its Jackpine Mine – Phase 1 approval to access additional mining areas on Oil Sand Leases located adjacent to the Jackpine Mine – Phase 1. The project would add another 100 000 barrels bitumen production per day. This would increase the total bitumen production capacity to 300 000 barrels per day. This expansion would include additional mining areas and associated processing facilities, utilities, and infrastructure. The project components which are part of the scope of this assessment include:

- Expansion of the Jackpine Mine – Phase 1 area on the eastern part of Lease 13 and extending mining activities to additional northern leases;
- Open pit, truck and shovel mine;
- Construction of ore handling, conditioning and bitumen extraction facilities and a high-temperature forth treatment facility at the Jackpine Mine – Phase 1 site;
- Construction of a cogeneration plant at the Jackpine Mine – Phase 1 site and adding new or augmenting existing utility systems;
- Constructing a new external tailings disposal area at the southern end of Lease 88 to accommodate the additional volume of tailing produced;
- Process facilities that would include:
    - Crushers and conveyors
    - Slurry conditioning and ore preparation
    - Extraction
    - Tailing handling and treatment
    - Froth treatment
    - Tailings solvent recovery
    - Asphaltene recovery
- Works and undertakings associated with the harmful alteration, disruption or destruction of fish habitat;
- Fish habitat compensation and any required infrastructure;
- All related works and activities including all temporary facilities required for the construction and operation of the above-mentioned facilities, namely
    - any access roads, work camps, electrical power supply lines or power supply for camps and worksites (new or modified);
    - drinking water supply for camps;
    - water supply for the project, including water storage facilities
    - temporary control structures and diversion works;
    - treatment of wastewaters and waste management;
    - construction worksites and storage areas;
    - management of excavation material;
    - handling and storage of petroleum products and hazardous materials

Part II - Scope of the Environmental Assessment

1. The Joint Review Panel shall conduct an assessment of the environmental effects of the project based on the Scope of Project (Part I).

2. The assessment shall include a consideration of the factors listed in paragraphs 16(1)(a) to (d) and subsection16(2) of the *Canadian Environmental Assessment Act*, namely:
   a. the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
   b. the significance of the effects referred to in paragraph a.;
   c. comments from the public, including Aboriginal persons and groups, that are received during the joint review;
   d. measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
   e. the purpose of the project;
   f. alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
   g. the need for, and the requirements of, any follow-up program in respect of the project; and
   h. the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.
3. The assessment by the Joint Review Panel shall also include a consideration of the additional following matters:
   a. the need for the project;
   b. alternatives to the project received during the joint review;
   c. effects of the project on asserted or established Aboriginal and treaty rights, to the extent the Joint Review Panel receives such information as provided in article 6 of the Agreement; and
   d. community knowledge and aboriginal traditional knowledge (such as traditional use studies) received during the joint review.

Part III – Scope of the factors

The scope of the factors include those specified in the "Final Terms of Reference" for the preparation of the Environmental Impact Assessment Report for the Shell Canada Limited Jackpine Mine Expansion & Pierre River Mine issued by Alberta Environment on November 28, 2007. The document is available on the public registry (document # 6).

In addition, the Joint Review Panel in considering the factors outlined in Part II shall have regard for the following:

Aboriginal Rights and Interests

The Joint Review Panel shall consider:

- Evidence concerning any potential project effects to asserted or established Aboriginal and treaty rights presented by participants, such as:
    - Any potential effects on uses of lands and resources by Aboriginal groups for traditional purposes;
    - Any effects (including the effects related to increased access and fragmentation of habitat) on hunting, fishing, trapping, cultural and other traditional uses of the land (*e.g.* collection of medicinal plants, use of sacred sites), as well as related effects on lifestyle, culture, health and quality of life of Aboriginal persons;
    - Any effects of alterations to access into areas used by Aboriginal persons for traditional uses;
    - Any adverse effects of the project on the ability of future generations to pursue traditional activities or lifestyle;
    - Any effects of the project on heritage and archaeological resources in the project area that are of importance or concern to Aboriginal groups;
- The methods and measures proposed to manage, mitigate and compensate to an acceptable level, any identified effects on asserted or established Aboriginal rights and interests.

Cumulative Effects Assessment

The cumulative effects assessment should take into consideration the approach described in the Agency's Cumulative Effects Assessment Practitioners Guide (1999) and in the Agency's Operation Policy Statement entitled "Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act" updated in November 2007.

The Joint Review Panel should focus its consideration of cumulative effects on key valued components. Without limiting itself thereto, the following components should be considered:

- water quality and quantity, including any potential effects on navigable waters or navigation;
- air quality and greenhouse gas emissions;
- asserted or established Aboriginal and treaty rights and interests;
- wildlife and wildlife habitat for valued species including: federally and provincially listed species at risk, and migratory birds; and
- valued vegetation communities and wetlands.

The cumulative effects assessment should provide a justification and description of the temporal boundaries and include, but not be limited to, the following:

- a pre-industrial case to allow the Joint Review Panel to take into account the effects that may have already been experienced prior to the project; and
- future foreseeable projects or activities as of the issuance of the Joint Review Panel's Terms of Reference.

Accidents & Malfunctions

In considering the environmental effects of malfunctions or accidents that may occur in connection with the project, the Joint Review Panel should include potential malfunctions or accidents associated with the following components:

- tailings management;
- waste management and disposal;
- use, handling or spills of chemicals and hazardous materials on-site;
- the increase in road traffic, and the risk of road accidents; and
- any other project components or systems that have the potential, through accident or malfunction, to adversely affect the natural environment.

The Joint Review Panel should consider the likelihood of occurrence of a malfunction or an accident and the sensitive elements of the environment (*e.g.* communities, homes, natural sites of interest, areas of major use) that may be affected in the event of any such malfunction or accident.

Plans, measures and systems to reduce the potential occurrence of a malfunction or accident should be considered in the assessment and should indicate how they will reduce the effects or consequences of any such malfunction or accident.

Effects of Changes to the Environment

Consistent with the definition of "environmental effects" in the *Canadian Environmental Assessment Act*, the Joint Review Panel shall consider the effects of any changes to the environment caused by the project on the following factors:

- Health and Socio-Economic Conditions, including effects on navigation
- Physical and Cultural Heritage
- Current use of lands and resources for traditional purposes by Aboriginal persons
- Any structure, site or thing that is of historical, archaeological or architectural significance

Change to the Project Caused by the Environment

Consistent with the definition of "environmental effects" in the *Canadian Environmental Assessment Act*, the Joint Review Panel will also consider any change to the project that may be caused by the environment.

Environmental changes and hazards that may occur and may affect the project shall be described. The Joint Review Panel should also take into account the potential influence of climate change scenarios presented by the proponent and interveners on climate parameters (e.g. precipitation, temperature), and physical environmental processes. The influence that these environmental changes and hazards may have on the project should be predicted and described. The environmental assessment should describe how these changes and hazards are accounted for in the project design.

Capacity of Renewable Resources

Renewable resources are resources such as fish, wildlife, trees, water quality and quantity and airshed which are replaced or replenished, on an ongoing basis, either naturally or by human actions.

The Joint Review Panel shall consider the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future. The following points should be addressed:

- a description of the renewable resources that may be affected by the project;
- a brief description of the project's environmental effects on the renewable resource;
- an indication as to the way in which the capacity of this resource was measured or evaluated;
- an indication of the temporal and geographic boundaries used to assess the capacity of the affected resource;
- a description of any other appropriate mitigation measures;
- a determination of the significance of the residual effects on the renewable resource and its capacity to meet the needs of current and future generations;

- an identification of the risks and uncertainties that remain and the description of the next steps, if any, that will be required to address this effect.

Part IV – Review Process

The main steps of the joint review by the Joint Review Panel will be as follows:

Review of the documentation

1. Within 15 days following its appointment, the Joint Review Panel will initiate a public comment period on whether the information available on the public registry is sufficient to allow a review that complies with the Joint Review Panel's Terms of Reference and to proceed to the public hearing phase of the process. The public will be provided with a minimum of 60 days to provide comments.

2. Comments received during the comment period will be immediately made available to the public through the public registry.

3. After the public comment period has closed, the Joint Review Panel will decide if it has adequate information to proceed to hearing. In so doing, the Joint Review Panel will consider its own review of the information, and any written comments from the public, including Aboriginal persons and groups, government departments, other governments or technical experts, and any written exchanges between interested parties.

4. Should the Joint Review Panel identify information deficiencies after reviewing the available information and considering any comments received, the Joint Review Panel shall require additional information from the proponent. Any requirement for additional information will be issued by the Joint Review Panel as soon as is reasonably practicable following the close of the public comment period.

5. If the Joint Review Panel concludes that it has adequate information to proceed to hearing, it will announce the hearing as soon as is reasonably practicable following the close of the public comment period, providing for a minimum of 60 days notice prior to the commencement of the hearing.

6. Notwithstanding paragraph 4 above, if the Joint Review Panel is of the view that it requires additional information from the proponent but the information deficiency is minor in nature, and the Joint Review Panel receives a commitment from the proponent to provide the outstanding information, the Joint Review Panel will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

Determination of Adequacy of Additional Information Requested by the Joint Review Panel

7. Upon receipt of additional information provided by the proponent pursuant to a requirement under paragraph 4 above, the Joint Review Panel will ensure that the information is made available to the public for review and comment for a period of at least 30 days.

8. If, after reviewing the additional information and any written comments from the public, the Joint Review Panel concludes that it has adequate information to proceed to hearing, it will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

9. If, after reviewing the additional information and any written comments from the public, the Joint Review Panel is still of the view that it does not have adequate information to proceed to hearing, it shall inform the proponent of the outstanding information requirements and indicate that the hearing will not be scheduled until that information has been provided by the proponent. Any additional information thereafter provided by the proponent will be subject to public comment in the manner described in paragraph 7 above.

10. Notwithstanding paragraph 9 above, if after reviewing the additional information and any written comments from the public the Joint Review Panel is of the view that the lack of information is minor in nature and the Joint Review Panel receives a commitment from the proponent to provide the outstanding information prior to the hearing, the Joint Review Panel will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

11. If at any time during the review process the Joint Review Panel requests additional information from the proponent, the Joint Review Panel may specify the date by which the proponent must provide the information.

Public Hearings

12. The Joint Review Panel shall hold the hearing in a location or locations selected by the Joint Review Panel, and will endeavour to hold at least a portion of the hearing in, or as near to as is practicable, one or more communities that:

- the Joint Review Panel believes may be affected by the project; or
- are nearest to the location where the project is proposed to be carried out.

Joint Review Panel Report

13. The Joint Review Panel will deliver its report to the Federal Minister of the Environment within 90 days following the close of the record. The report will take into account and reflect the views of all Joint Review Panel members.

MEMORANDUM

Amendment to the Agreement To Establish a Joint Review Panel for the Jackpine Mine Expansion Project

Between

The Minister of the Environment, Canada

- and –

Energy Resources Conservation Board, Alberta

WHEREAS each of the Parties signed the Agreement To Establish a Joint Review Panel for the Jackpine Mine Expansion Project (hereinafter referred to as the Agreement) dated September 13, 2011 to establish a Joint Review Panel for the Jackpine Mine Expansion Project; and

WHEREAS section 13 of the Agreement allows it to be amended by written memorandum executed by both the Federal Minister of the Environment and the Chairman of the Energy Resources Conservation Board (ERCB); and

WHEREAS the Parties wish to amend the Agreement to allow the Joint Review Panel to coordinate its review process with the review process for the Pierre River Mine Project, where the Joint Review Panel determines that the joint panel review may benefit from a coordinated review process.

Now Therefore, the Parties hereby amend the Agreement as follows:

1. The Agreement is amended by adding the following paragraphs as the third last and second last paragraphs of the Preamble:

"**WHEREAS** the Federal Minister of the Environment and the ERCB have established a joint review panel for the Pierre River Mine Project, as evidenced by their written agreement; and

WHEREAS the Federal Minister of the Environment and the ERCB have determined that, given commonalities between the two projects and the single, integrated Environmental Impact Statement that has been prepared for the two projects, the joint review panel for this project may proceed with increased efficiency from coordinating its review process with the review process for the Pierre River Mine Project.

2. Article 4 of the Agreement is amended by adding the following Articles 4.6, 4.7 and 4.8 thereto:

"4.6 If at any time prior to issuing its report, the Joint Review Panel is of the opinion that the review process for the project may proceed with increased efficiency by being coordinated with the review process for the Pierre River Mine Project, the Joint Review Panel may coordinate this review process with the Pierre River Mine Project's review process.

4.7 The Joint Review Panel may at any time consider the progress of the Pierre River Mine Project review process when making decisions about the conduct of the Jackpine Mine Expansion Project review process, and may decide to coordinate the review processes as set out in Article 4.6.

4.8 If the Joint Review Panel decides to coordinate the review process for the project with the review process for the Pierre River project, the Joint Review Panel shall ensure that the coordination of the review processes is done in a manner consistent with this Agreement, and in a manner that ensures that the review process for the project is procedurally fair.

3. Article 7.3 is amended by replacing Article 7.3 with the following:

7.3 On completion of the assessment of the project, the Joint Review Panel shall prepare a report. The report shall include an executive summary in both official languages. The report will set out the rationale, conclusions and recommendations of the Joint Review Panel relating to the environmental assessment of the project, including any mitigation measures and follow-up program, and a summary of comments received from the public, including Aboriginal persons and groups. The report will be conveyed to the Government of Alberta and the Federal Minister of the Environment within 90 days of the close of the record if the public hearing is not coordinated with the Pierre River Mine Project's public hearing, or within 120 days of the close of the record if the public hearing is coordinated with the Pierre River Mine Project's public hearing. Simultaneously, the report will be published and made available to the public by the Joint Review Panel.

4. Part IV of the Agreement entitled "Appendix - Terms of Reference" is amended as follows:

a) The existing paragraph 5 is deleted and replaced with the following:

"If the Joint Review Panel concludes that it has adequate information to proceed to hearing, it will announce the hearing following the close of the public comment period; however, the Joint Review Panel may defer announcing the hearing until after a decision to hold a hearing has been made by the joint review panel considering the Pierre River Mine Project. In any case, the Joint Review Panel shall provide for a minimum of 60 days notice prior to the commencement of the hearing."

b) The title "Public Hearings" that appears following paragraph 11 is changed to "Public Hearings and Coordinated Review Process";

c) The following paragraph is added below the heading "Review Process", in Part IV of the Appendix, Terms of Reference and before "The main steps of the joint review by the Joint Review Panel will be as follows:"

"The Joint Review Panel may coordinate its review process with the review process for the Pierre River Mine Project, as provided in Articles 4.6, 4.7 and 4.8 of this Agreement; and

d) The following paragraph is added as paragraph 12 of Part IV of the Appendix, Terms of Reference:

"The Joint Review Panel may coordinate or combine its public hearing with the Pierre River Mine Project public hearing, as provided in Article 4 of this Agreement. If the Panel considers coordinating the two public hearings, it must consult the public on the proposed public hearing process and timing."

e) The original paragraph 12 is renumbered as paragraph 13.

f) The original paragraph 13 is renumbered as paragraph 14 and the text is amended by replacing the text with the following:

"The Joint Review Panel will deliver its report to the Federal Minister of the Environment within 90 days following the close of the record if the public hearing is not coordinated with the Pierre River Mine Project's public hearing, or will deliver two separate reports, one for each of the two Projects, within 120 days following the close of the record if the public hearing is coordinated with the Pierre River Mine Project's public hearing. The report will take into account and reflect the views of all Joint Review Panel members."

5. The Agreement, as hereby amended, remains in full force and effect in accordance with the terms thereof.

The Honourable Peter Kent
Minister of the Environment

MAR 2 1 2012

Date

Dan McFadyen, Chairman
Energy Resources Conservation Board

May 30, 2012

Date

AMENDED AGREEMENT
To Establish a Joint Review Panel for the Jackpine Mine Expansion Project

Between

The Minister of the Environment, Canada

- and -

The Energy Resources Conservation Board, Alberta

PREAMBLE

WHEREAS the Energy Resources Conservation Board (the ERCB) has statutory responsibilities pursuant to the *Energy Resources Conservation Act*; and

WHEREAS the Minister of the Environment, Canada (the Federal Minister of the Environment) has statutory responsibilities pursuant to the *Canadian Environmental Assessment Act, 2012*; and

WHEREAS the Jackpine Mine Expansion Project (the project) requires a public hearing and approvals from the ERCB pursuant to the *Energy Resources Conservation Act*, and the *Oil Sands Conservation Act*, and is subject to an assessment under the *Canadian Environmental Assessment Act*; and

WHEREAS the Canadian Environmental Assessment Agency (the Agency) has requested, in accordance with section 25 of the *Canadian Environmental Assessment Act*, that the Federal Minister of the Environment refer the project to a review panel; and

WHEREAS the Federal Minister of the Environment has referred the project to a review panel in accordance with section 29 of the *Canadian Environmental Assessment Act*; and

WHEREAS the Government of the Province of Alberta and the Government of Canada established a framework for conducting joint review panels through the *Canada-Alberta Agreement on Environmental Assessment Cooperation (2005)* signed on May 17, 2005; and

WHEREAS the ERCB and the Federal Minister of the Environment have determined that a joint review of the project will ensure that the project is evaluated according to the spirit and requirements of their respective authorities while avoiding unnecessary duplication, delays and confusion that could arise from individual reviews by each government or the ERCB; and

WHEREAS the ERCB and the Federal Minister of the Environment have determined that a joint review of the project should be conducted in a manner consistent with the provisions of Appendix 2 of the *Canada-Alberta Agreement on Environmental Assessment Cooperation (2005)*; and

WHEREAS the Federal Minister of the Environment has determined that pursuant to subsection 40(2) of the *Canadian Environmental Assessment Act* a joint review panel should be established to consider the project; and

WHEREAS the *Canadian Environmental Assessment Act* has been repealed and the *Canadian Environmental Assessment Act, 2012* has come into force; and

WHEREAS pursuant to section 126 of the *Canadian Environmental Assessment Act, 2012*, the assessment by the joint review panel is continued under the process established under the *Canadian Environmental Assessment Act, 2012* as if it had been referred to a review panel under section 38 of the *Canadian Environmental Assessment Act, 2012*; and

WHEREAS the ERCB has determined that pursuant to section 22 of the *Energy Resources Conservation Act* a joint review panel cooperative proceeding should be established and that the project should be considered in a cooperative proceeding by the ERCB and the Agency; and

WHEREAS the Federal Minister of the Environment and the ERCB have established a joint review panel for the Pierre River Mine Project, as evidenced by their written agreement; and

WHEREAS the Federal Minister of the Environment and the ERCB have determined that, given commonalities between the two projects and the single, integrated Environmental Impact Statement that has been prepared for the two projects, the joint review panel for this project may proceed with increased efficiency from coordinating its review process with the review process for the Pierre River Mine Project;

THEREFORE, the ERCB and the Federal Minister of the Environment hereby establish a joint review panel for the project in accordance with the provisions of this Agreement and the Terms of Reference attached as an Appendix to this Agreement.

1. Definitions

For the purpose of this Agreement and of the Appendix attached to it,

"**Agency**" means the Canadian Environmental Assessment Agency established by the *Canadian Environmental Assessment Act* and continued under the *Canadian Environmental Assessment Act, 2012*.

"**environment**" means the components of the Earth, and includes

a. land, water and air, including all layers of the atmosphere;
b. all organic and inorganic matter and living organisms; and
c. the interacting natural systems that include components referred to in a. and b.

"**environmental effect**" means, in respect of the project,

a. any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residence of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
b. any effect of any change referred to in paragraph a. on
    i. health and socio-economic conditions
    ii. physical and cultural heritage
    iii. the current use of lands and resources for traditional purposes by Aboriginal persons, or
    iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
c. any change to the project that may be caused by the environment

whether any such change or effect occurs within or outside Canada.

"**federal authority**" refers to such an authority as defined in the *Canadian Environmental Assessment Act, 2012.*

"**report**" means the document produced by the Joint Review Panel, which contains decisions pursuant to the *Energy Resources Conservation Act* or the *Oil Sands Conservation Act*, and the Joint Review Panel's rationale, conclusions and recommendations relating to the environmental assessment of the project including any mitigation measures and follow-up program pursuant to the *Canadian Environmental Assessment Act, 2012.*

"follow-up program" means a program for

a. verifying the accuracy of the environmental assessment of the project, and
b. determining the effectiveness of any mitigation measures.

"**Joint Review Panel**" refers to the Joint Review Panel established by the ERCB and the Federal Minister of the Environment through this Agreement.

"**mitigation**" means, in respect of the project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

"**parties**" means the signatories to this Agreement.

“proponent” has the meaning provided in section 2 of the *Canadian Environmental Assessment Act, 2012.*

“**public registry**” means the Canadian Environmental Assessment Registry established under section 78 of the *Canadian Environmental Assessment Act, 2012.*

"**responsible authority**" refers to such an authority as defined in the *Canadian Environmental Assessment Act, 2012.*

2. Establishment of the Joint Review Panel

2.1 A process is hereby established to create a Joint Review Panel, pursuant to section 22 of the *Energy Resources Conservation Act* with the authorization of the Lieutenant Governor in Council of Alberta, and sections 40, 41 and 42 of the Canadian Environmental Assessment Act, for the purposes of the joint review of the project.

2.2 The ERCB and the Agency will make arrangements to coordinate the announcements of a joint review of the project by both Alberta and Canada.

3. Constitution of the Joint Review Panel

3.1 The Joint Review Panel will consist of three members. Two members, including the Joint Review Panel Chair, will be appointed by the Chair of the ERCB with the approval of the Federal Minister of the Environment. The third Joint Review Panel member will be appointed by the Federal Minister of the Environment in accordance with article 3.2 of this Agreement.

3.2 The Federal Minister of the Environment will select the third Joint Review Panel member and recommend the selected candidate as an individual who may serve as a potential acting member of the ERCB. If acceptable to the Lieutenant Governor in Council of Alberta and the Chairman of the ERCB, the Lieutenant Governor in Council of Alberta will nominate this candidate to serve as an acting member of the ERCB and the Chairman of the ERCB will appoint this candidate as a member of the Joint Review Panel. The selected candidate will also be appointed by the Federal Minister of the Environment as a member of the Joint Review Panel.

3.3 The Joint Review Panel members shall be unbiased and free from any conflict of interest relative to the project and are to have knowledge or experience relevant to the anticipated environmental effects of the project.

4. Conduct of Assessment by the Joint Review Panel

4.1 The Joint Review Panel shall conduct its review in a manner that discharges the responsibilities of the ERCB under the *Energy Resources Conservation Act*.

4.2 The Joint Review Panel shall conduct its review in a manner that discharges the requirements set out in the *Canadian Environmental Assessment Act, 2012* and in the Terms of Reference attached as an Appendix to this Agreement and that were fixed and approved by the Federal Minister of the Environment and the ERCB.

4.3 The Joint Review Panel shall have all the powers and duties of a panel described in section 45 of the *Canadian Environmental Assessment Act, 2012* and of a division of the ERCB described in section 8 of the *Energy Resources Conservation Act*.

4.4 The Joint Review Panel hearing shall be public and the review will provide opportunities for timely and meaningful participation by the public, including Aboriginal persons and groups. Hearing participants will not be required to satisfy the test under subsection 26(2) of the *Energy Resources Conservation Act*. The Joint Review Panel shall conduct its hearing in accordance with the ERCB's *Rules* *of Practice*. The Joint Review Panel will, however, attempt to make the review process as accessible as reasonably possible for individuals or groups who are not represented by legal counsel or who may lack experience with the quasi-judicial nature of the hearing process.

4.5 A majority of the Joint Review Panel members constitutes a quorum for the purposes of the environmental assessment to be conducted by the Joint Review Panel. When a hearing, public meeting, or other activity is conducted by the Joint Review Panel and a member of the Joint Review Panel for any reason does not attend on any day or part of a day, the other members who are sitting at the hearing, public meeting or other activity may continue as fully and effectively as though the absent member was present.

4.6 If at any time prior to issuing its report, the Joint Review Panel is of the opinion that the review process for the project may proceed with increased efficiency by being coordinated with the review process for the Pierre River mine Project, the Joint Review Panel may coordinate this review process with the Pierre River Mine Project's review process.

4.7 The Joint Review Panel may at any time consider the progress of the Pierre River mine Project review process when making decisions about the conduct of the Jackpine Mine Expansion Project review process, and may decide to coordinate the review processes as set out in article 4.6.

4.8 If the Joint Review Panel decides to coordinate the review process for the project with the review process for the Pierre River project, the Joint Review Panel shall ensure that the coordination of the review processes is done in a manner consistent with this Agreement, and in a manner that ensures that the review process for the project is procedurally fair.

5. Secretariat

5.1 Administrative, technical, and procedural support requested by the Joint Review Panel shall be provided by a Secretariat, which shall be the joint responsibility of the ERCB and the Agency.

5.2 The Secretariat will report to the Joint Review Panel and will be structured so as to allow the Joint Review Panel to conduct its review in an efficient and cost-effective manner.

5.3 The ERCB will provide its offices for the conduct of the activities of the Joint Review Panel and the Secretariat.

6. Aboriginal Rights and Interests

6.1 The Joint Review Panel may receive information from Aboriginal groups related to the nature and scope of asserted or established Aboriginal and treaty rights in the area of the project, as well as information on the potential adverse environmental effects that the project may have on asserted or established Aboriginal and treaty rights. The Joint Review Panel may also receive information provided in this regard by other participants, federal authorities or government, and provincial departments or government.

6.2 The Joint Review Panel shall reference in its report:

a. the information provided by participants regarding the manner in which the project may adversely affect asserted or established Aboriginal and treaty rights; and

b. the information provided by participants regarding the strength of claim in respect of Aboriginal and treaty rights asserted by a participant, including information about the location, extent, bases and exercise of those asserted Aboriginal and treaty rights in the area of the project.

For the purposes of its report, the Joint Review Panel shall document claims of Aboriginal and treaty rights as presented by participants and consider the effects of the project on the Aboriginal and treaty rights so presented. The Joint Review Panel may use this information to make recommendations that relate to the manner in which the project may adversely affect the Aboriginal and treaty rights asserted by participants.

6.3 Notwithstanding articles 6.1 and 6.2, the Joint Review Panel is not required by this agreement to make any determinations as to:

a. the validity of Aboriginal or treaty rights asserted by a participant or the strength of such claims;
b. the scope of the Crown's duty to consult an Aboriginal group; or
c. whether the Crown has met its respective duties to consult or accommodate in respect of rights recognized and affirmed by section 35 of the *Constitution Act, 1982*.

6.4 Nothing in this article 6 limits the application of Part 2 of the *Administrative Procedures and Jurisdiction Act* to the ERCB, and the Joint Review Panel (in its capacity as a division of the ERCB) remains at all times subject to the requirements of, and entitled to exercise the powers under Part 2 of the *Administrative Procedures and Jurisdiction Act*, including but not limited to section 13 thereof.

7. Record of Joint Review and Report

7.1 A public registry will be maintained by the Secretariat during the course of the joint review in a manner that provides for convenient public access, and for the purposes of compliance with sections 79 to 81of the *Canadian Environmental Assessment Act, 2012*.

7.2 Subject to subsections 45(3), (4), and (5) and 79(3) of the *Canadian Environmental Assessment Act, 2012*, the public registry will include all submissions, correspondence, hearing transcripts, exhibits and other information received by the Joint Review Panel and all public information produced by the Joint Review Panel relating to the review of the project.

7.3 On completion of the assessment of the project, the Joint Review Panel shall prepare a report. The report shall include an executive summary in both official languages. The report will set out the rationale, conclusions and recommendations of the Joint Review Panel relating to the environmental assessment of the project, including any mitigation measures and follow-up program, and a summary of comments received from the public, including Aboriginal persons and groups. The report will be conveyed to the Government of Alberta and the Federal Minister of the Environment within 90 days of the close of record if the public hearing is not coordinated with the Pierre River Mine Project's public hearing, or within 120 days of the close of the record if the public hearing is coordinated with the Pierre River Mine Project's public hearing. Simultaneously, the report will be published and made available to the public by the Joint Review Panel. The report will include:

- An identification of those conclusions that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*; and
- An identification of recommended mitigation measures that relate to the environmental effects to be taken into account under section 5 of the *Canadian Environmental Assessment Act, 2012*.

7.4 After the report is submitted, the Agency will maintain the public registry. The ERCB will continue to maintain records of the proceedings and the report in accordance with its normal practices and procedures.

7.5 The Agency will be responsible for the translation of key documents prepared by the Joint Review Panel, including public notifications and releases and the report, into both of the official languages of Canada. The Agency will use all reasonable efforts to expedite the translation of the report.

8. Other Government Departments

8.1 The Joint Review Panel may request federal authorities and provincial authorities having specialized information or knowledge with respect to the project to make that information or knowledge available to the Joint Review Panel in an acceptable manner.

8.2 Nothing in this Agreement will restrict the participation by way of submission to the Joint Review Panel by other federal or provincial government departments or bodies, subject to article 8.1, above, subsection 20 of the *Canadian Environmental Assessment Act, 2012* and the ERCB Rules of Practice.

9. Participant Funding

9.1 Decisions regarding participant funding by the Agency under the federal Participant Funding Program, and decisions on local intervener funding by the ERCB as provided for in the *Energy Resources Conservation Act*, ERCB Rules of Practice and the ERCB's Directive 31: Guidelines for Energy Proceeding Cost Claims will, to the extent practicable, take into account decisions of the other party.

10. Cost Sharing

10.1 The ERCB, as lead party, will develop a budget estimate of expenses agreeable to both parties prior to initiation of the Joint Review Panel activities.

10.2 The costs of the joint review will be apportioned between the ERCB and the Agency in the manner set out in articles 10.3, 10.4 and 10.5.

10.3 The ERCB will be solely responsible for the following costs:

- salaries and benefits of the Joint Review Panel Chairman and the member of the Joint Review Panel not appointed in accordance with article 3.2; and
- salaries and benefits of ERCB staff involved in the joint review.

10.4 The Agency will be solely responsible for the following costs:

- per diems of the Joint Review Panel member appointed in accordance with article 3.2;
- salaries and benefits of Agency staff involved in the joint review;
- all costs associated with the Agency's legal counsel for the proceeding;
- all costs associated with the federal Participant Funding Program;
- translation of records and documents into the official languages of Canada other than translation required as outlined in article 10.5 of this Agreement; and
- costs associated with the public registry established pursuant to section 78(1) of the *Canadian Environmental Assessment Act, 2012*.

10.5 The ERCB and the Agency agree to share equally all those costs listed below, incurred as part of the joint review from the signing of this Agreement to the date the report is issued by the Joint Review Panel. The shareable costs are as follows:

- travel-related expenses associated with the review incurred by Joint Review Panel members and Joint Review Panel Secretariat staff;
- per diems and associated expenses of independent/non-government expert consultants, analysts and communications specialists retained by the Secretariat;
- language translation and interpretation services and facilities related to the evidence of applicants, participants and local interveners as required by the Joint Review Panel, but not including translation service referred to in article 7.5 of this Agreement;
- printing of any reports and documents distributed by the Joint Review Panel necessary for the Joint Review Panel's work;
- the publication of notices and releases;
- photocopying, including the reproduction of documents contained in the public registry, and postage related to the joint review;
- court reporting and transcripts as required by the Joint Review Panel;
- rental of hearing, public meeting and public information office facilities and equipment;
- audio and audio-visual services at the hearing and public meetings; and
- miscellaneous expenditures up to a maximum of five percent (5%) of the total budget for the joint review.

10.6 The Agency may only be responsible for contributing to shareable costs within the allowable limits of Treasury Board Secretariat directives.

10.7 Shareable costs of the joint review as detailed in article 10.5 will be incurred at the sole discretion of the Joint Review Panel with due regard to economy and efficiency.

10.8 All expenses not listed above will need prior approval of both parties if they are to be equally shared.

11. Invoicing

11.1 The ERCB will be responsible for advancing funds for the payment of the shareable costs and will invoice the Agency for the amounts owed under this Agreement, except for travel-related expenses of the Agency's staff which will be advanced by the Agency. In the event that the Agency is required to advance shareable funds directly, it will advance funds for payment and will invoice the ERCB as determined under this Agreement.

11.2 The invoicing will be done either at the end of each month or quarterly at the discretion of the ERCB. The invoice will cover all shareable costs paid by the ERCB.

11.3 Each invoice will be accompanied by a summary description of the shareable costs actually incurred and paid for the period covered by the invoice, in a form satisfactory to both parties and will be approved by an official acceptable to both parties. Detailed information about incurred costs will be retained and made available to either Party upon request.

11.4 Subject to compliance with the above requirements, the Agency will pay to the ERCB the amount stated as being owed to it in the invoice within sixty (60) days of having received such invoice.

11.5 With respect to invoices covering the last period of any fiscal year (ending March 31), and the last invoice to be produced for the Joint Review Panel, each Party may review and deduct from the invoice, any incurred shareable costs that have not been previously recovered, so as to determine a net transfer of shared costs from one party to another. The payment will be made within thirty (30) days of having received such invoice. An accounting of the shared expenses incurred by the Agency will be sent with the year-end and final payments, or earlier as may be requested by the ERCB.

12. Audit

12.1 Subject to this Agreement, both parties will keep open to audit and inspection by the Agency or the ERCB, or their duly authorized representative, all invoices, receipts, vouchers and documents of any nature or kind whatsoever that have been relied on by either of the two parties to calculate the shared cost of conducting the public review.

12.2 The Party exercising its option to audit will be responsible for the cost of the audit.

12.3 Where an audit conducted by either Party in connection with this Agreement reveals discrepancies regarding the amount billed to the Agency, and where prompt resolution between the parties is unattainable, an independent auditor acceptable to both parties will resolve the issue.

13. Amending this Agreement

13.1 The terms and provisions of this Agreement may be amended by written memorandum executed by both the Federal Minister of the Environment and the Chairman of the ERCB. Subject to section 64 of the *Canadian Environmental Assessment Act, 2012*, upon completion of the joint review, this Agreement may be terminated at any time by an exchange of letters signed by both parties.

14. Signatures

WHEREAS the parties hereto have put their signatures

The Honourable Peter Kent Minister of the Environment	Dan McFadyen, P.Eng. Chairman Energy Resources Conservation Board
Date	Date

Appendix
Terms of Reference

Part I - Scope of Project

Shell Canada Limited is requesting to amend its Jackpine Mine – Phase 1 approval to access additional mining areas on Oil Sand Leases located adjacent to the Jackpine Mine – Phase 1. The project would add another 100 000 barrels bitumen production per day. This would increase the total bitumen production capacity to 300 000 barrels per day. This expansion would include additional mining areas and associated processing facilities, utilities, and infrastructure. The project components which are part of the scope of this assessment include:

- Expansion of the Jackpine Mine – Phase 1 area on the eastern part of Lease 13 and extending mining activities to additional northern leases;
- Open pit, truck and shovel mine;
- Construction of ore handling, conditioning and bitumen extraction facilities and a high-temperature forth treatment facility at the Jackpine Mine – Phase 1 site;
- Construction of a cogeneration plant at the Jackpine Mine – Phase 1 site and adding new or augmenting existing utility systems;
- Constructing a new external tailings disposal area at the southern end of Lease 88 to accommodate the additional volume of tailing produced;
- Process facilities that would include:
    - Crushers and conveyors
    - Slurry conditioning and ore preparation
    - Extraction
    - Tailing handling and treatment
    - Froth treatment
    - Tailings solvent recovery
    - Asphaltene recovery
- Works and undertakings associated with the harmful alteration, disruption or destruction of fish habitat;
- Fish habitat compensation and any required infrastructure;
- All related works and activities including all temporary facilities required for the construction and operation of the above-mentioned facilities, namely
    - any access roads, work camps, electrical power supply lines or power supply for camps and worksites (new or modified);
    - drinking water supply for camps;
    - water supply for the project, including water storage facilities
    - temporary control structures and diversion works;
    - treatment of wastewaters and waste management;
    - construction worksites and storage areas;
    - management of excavation material;
    - handling and storage of petroleum products and hazardous materials

Part II - Scope of the Environmental Assessment

1. The Joint Review Panel shall conduct an assessment of the environmental effects of the project based on the Scope of Project (Part I).

2. The assessment shall include a consideration of the following factors:
   a. the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
   b. the significance of the effects referred to in paragraph a.;
   c. comments from the public, including Aboriginal persons and groups, that are received during the joint review;
   d. measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
   e. the purpose of the project;
   f. alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
   g. the need for, and the requirements of, any follow-up program in respect of the project; and
   h. the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

3. The assessment by the Joint Review Panel shall also include a consideration of the additional following matters:
   a. the need for the project;
   b. alternatives to the project received during the joint review;
   c. effects of the project on asserted or established Aboriginal and treaty rights, to the extent the Joint Review Panel receives such information as provided in article 6 of the Agreement; and
   d. community knowledge and aboriginal traditional knowledge (such as traditional use studies) received during the joint review.

Part III – Scope of the factors

The scope of the factors include those specified in the "Final Terms of Reference" for the preparation of the Environmental Impact Assessment Report for the Shell Canada Limited Jackpine Mine Expansion & Pierre River Mine issued by Alberta Environment on November 28, 2007. The document is available on the public registry (document # 6).

In addition, the Joint Review Panel in considering the factors outlined in Part II shall have regard for the following:

Aboriginal Rights and Interests

The Joint Review Panel shall consider:

- Evidence concerning any potential project effects to asserted or established Aboriginal and treaty rights presented by participants, such as:

  - Any potential effects on uses of lands and resources by Aboriginal groups for traditional purposes;

  - Any effects (including the effects related to increased access and fragmentation of habitat) on hunting, fishing, trapping, cultural and other traditional uses of the land (*e.g.* collection of medicinal plants, use of sacred sites), as well as related effects on lifestyle, culture, health and quality of life of Aboriginal persons;

  - Any effects of alterations to access into areas used by Aboriginal persons for traditional uses;

  - Any adverse effects of the project on the ability of future generations to pursue traditional activities or lifestyle;

  - Any effects of the project on heritage and archaeological resources in the project area that are of importance or concern to Aboriginal groups;

- The methods and measures proposed to manage, mitigate and compensate to an acceptable level, any identified effects on asserted or established Aboriginal rights and interests.

Cumulative Effects Assessment

The cumulative effects assessment should take into consideration the approach described in the Agency's Cumulative Effects Assessment Practitioners Guide (1999) and in the Agency's Operation Policy Statement entitled "Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act" updated in November 2007.

The Joint Review Panel should focus its consideration of cumulative effects on key valued components. Without limiting itself thereto, the following components should be considered:

- water quality and quantity, including any potential effects on navigable waters or navigation;
- air quality and greenhouse gas emissions;
- asserted or established Aboriginal and treaty rights and interests;
- wildlife and wildlife habitat for valued species including: federally and provincially listed species at risk, and migratory birds; and
- valued vegetation communities and wetlands.

The cumulative effects assessment should provide a justification and description of the temporal boundaries and include, but not be limited to, the following:

- a pre-industrial case to allow the Joint Review Panel to take into account the effects that may have already been experienced prior to the project; and
- future foreseeable projects or activities as of the issuance of the Joint Review Panel's Terms of Reference.

Accidents & Malfunctions

In considering the environmental effects of malfunctions or accidents that may occur in connection with the project, the Joint Review Panel should include potential malfunctions or accidents associated with the following components:

- tailings management;
- waste management and disposal;
- use, handling or spills of chemicals and hazardous materials on-site;
- the increase in road traffic, and the risk of road accidents; and
- any other project components or systems that have the potential, through accident or malfunction, to adversely affect the natural environment.

The Joint Review Panel should consider the likelihood of occurrence of a malfunction or an accident and the sensitive elements of the environment (*e.g.* communities, homes, natural sites of interest, areas of major use) that may be affected in the event of any such malfunction or accident.

Plans, measures and systems to reduce the potential occurrence of a malfunction or accident should be considered in the assessment and should indicate how they will reduce the effects or consequences of any such malfunction or accident.

Effects of Changes to the Environment

The Joint Review Panel shall consider the effects of any changes to the environment caused by the project on the following factors:

- Health and Socio-Economic Conditions, including effects on navigation
- Physical and Cultural Heritage
- Current use of lands and resources for traditional purposes by Aboriginal persons
- Any structure, site or thing that is of historical, archaeological or architectural significance

Change to the Project Caused by the Environment

The Joint Review Panel will also consider any change to the project that may be caused by the environment.

Environmental changes and hazards that may occur and may affect the project shall be described. The Joint Review Panel should also take into account the potential influence of climate change scenarios presented by the proponent and interveners on climate parameters (e.g. precipitation, temperature), and physical environmental processes. The influence that these environmental changes and hazards may have on the project should be predicted and described. The environmental assessment should describe how these changes and hazards are accounted for in the project design.

Capacity of Renewable Resources

Renewable resources are resources such as fish, wildlife, trees, water quality and quantity and airshed which are replaced or replenished, on an ongoing basis, either naturally or by human actions.

The Joint Review Panel shall consider the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future. The following points should be addressed:

- a description of the renewable resources that may be affected by the project;
- a brief description of the project's environmental effects on the renewable resource;
- an indication as to the way in which the capacity of this resource was measured or evaluated;
- an indication of the temporal and geographic boundaries used to assess the capacity of the affected resource;
- a description of any other appropriate mitigation measures;
- a determination of the significance of the residual effects on the renewable resource and its capacity to meet the needs of current and future generations;
- an identification of the risks and uncertainties that remain and the description of the next steps, if any, that will be required to address this effect.

Part IV – Review Process

The Joint Review Panel may coordinate its review process with the review process for the Pierre River Mine Project, as provided in articles 4.6, 4.7 and 4.8 of this Agreement; and the main steps of the joint review by the Joint Review Panel will be as follows:

Review of the documentation

1. Within 15 days following its appointment, the Joint Review Panel will initiate a public comment period on whether the information available on the public registry is sufficient to allow a review that complies with the Joint Review Panel's Terms of Reference and to proceed to the public hearing phase of the process. The public will be provided with a minimum of 60 days to provide comments.

2. Comments received during the comment period will be immediately made available to the public through the public registry.

3. After the public comment period has closed, the Joint Review Panel will decide if it has adequate information to proceed to hearing. In so doing, The Joint Review Panel will consider its own review of the information, and any written comments from the public, including Aboriginal persons and groups, government departments, other governments or technical experts, and any written exchanges between the participants and the participants and the proponent.

4. Should the Joint Review Panel identify information deficiencies after reviewing the available information and considering any comments received, the Joint Review Panel shall require additional information from the proponent. Any requirement for additional information will be issued by the Joint Review Panel as soon as is reasonably practicable following the close of the public comment period.

5. If the Joint Review Panel concludes that it has adequate information to proceed to hearing, it will announce the hearing following the close of the public comment period; however, the Joint Review Panel may defer announcing the hearing until after a decision to hold a hearing has been made by the joint review panel considering the Pierre River Mine Project. In any case, the Joint Review Panel shall provide for a minimum of 60 days notice prior to the commencement of the hearing.

6. Notwithstanding paragraph 4 above, if the Joint Review Panel is of the view that it requires additional information from the proponent but the information deficiency is minor in nature, and the Joint Review Panel receives a commitment from the proponent to provide the outstanding information, the Joint Review Panel will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

Determination of Adequacy of Additional Information Requested by the Joint Review Panel

7. Upon receipt of additional information provided by the proponent pursuant to a requirement under paragraph 4 above, the Joint Review Panel will ensure that the information is made available to the public for review and comment for a period of at least 30 days.

8. If, after reviewing the additional information and any written comments from the public, the Joint Review Panel concludes that it has adequate information to proceed to hearing, it will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

9. If, after reviewing the additional information and any written comments from the public, the Joint Review Panel is still of the view that it does not have adequate information to proceed to hearing, it shall inform the proponent of the outstanding information requirements and indicate that the hearing will not be scheduled until that information has been provided by the proponent. Any additional information thereafter provided by the proponent will be subject to public comment in the manner described in paragraph 7 above.

10. Notwithstanding paragraph 9 above, if after reviewing the additional information and any written comments from the public the Joint Review Panel is of the view that the lack of information is minor in nature and the Joint Review Panel receives a commitment from the proponent to provide the outstanding information prior to the hearing, the Joint Review Panel will announce the hearing, providing for a minimum of 60 days notice prior to the commencement of the hearing.

11. If at any time during the review process the Joint Review Panel requests

additional information from the proponent, the Joint Review Panel may specify the date by which the proponent must provide the information.

Public Hearings and Coordinated Review Process

12. The Joint Review Panel may coordinate or combine its public hearing with the Pierre River Mine Project public hearing, as provided in Article 4 of this Agreement. If the Panel considers coordinating the two public hearings, it must consult the public on the proposed public hearing process and timing.

13. The Joint Review Panel shall hold the hearing in a location or locations selected by the Joint Review Panel, and will endeavour to hold at least a portion of the hearing in, or as near to as is practicable, one or more communities that:

    - the Joint Review Panel believes may be affected by the project; or
    - are nearest to the location where the project is proposed to be carried out.

Joint Review Panel Report

14. The Joint Review Panel will deliver its report to the Federal Minister of the Environment within 90 days following the close of the record if the public hearing is not coordinated with the Pierre River Mine Project's public hearing, or will deliver two separate reports, one for each of the two Projects, within 120 days following the close of the record if the public hearing is coordinated with the Pierre River Mine Project's public hearing. The report will take into account and reflect the views of all Joint Review Panel members.

Timelines

15. Subject to paragraph 16, the Panel shall complete its mandate and submit its final report to the federal Minister of the Environment and the Chairman of the Energy Resources Conservation Board within 350 days from the coming into force of the *Canadian Environmental Assessment Act, 2012*.

16. The time period between the issuance by the Panel of any request for information and the submission of the requested information by the proponent is not included in the timeline referred to in paragraph 15.

APPENDIX 4 PANEL DECISION ON NQCL

Joint Review Panel
Established to review the Jackpine Mine Expansion Project

Canadian Environmental Assessment Agency, 160 Elgin Street, 22nd Floor, Place Bell Canada, Ottawa, ON, K1A 0H3, 613-948-2674
Energy Resources Conservation Board, 9915 Franklin Avenue, Provincial Building, 2nd Floor, Fort McMurray, AB, T9H 2K4, 780-743-7473

October 26, 2012

TO: ALL INTERESTED PARTIES

Re: Jackpine Mine Expansion Project (the "Project")
CEAR Reference Number 10-05-59540
ERCB Application No. 1554388
Notices of Questions of Constitutional Law

The Joint Review Panel ("Panel") received notices of questions of constitutional law ("NQCL") from the following interested parties: Athabasca Chipewyan First Nation ("ACFN"); Fort McMurray #468 First Nation ("FMFN"); and Métis Nation of Alberta Region 1 ("MNA"). The Panel provided participants in this proceeding and the addressees of the NQCLs with a process to provide written submissions with regard to matters that may bear on the Panel's jurisdiction over or consideration of the questions presented in the NQCLs. The Panel also gave the NQCL filers an opportunity to provide submissions in reply to those filed by other participants. The Minister of Justice and the Attorney General of Alberta ("Alberta"), the Attorney General of Canada ("Canada"), Shell Canada Limited ("Shell") and the FMFN filed written submissions; however, the FMFN subsequently advised that it would not be pursuing its NQCL or leading any evidence in support of its NQCL. ACFN and MNA provided reply submissions.

The questions are set out below in this letter.

After considering the written submissions, the Panel decided to hold a hearing session to receive oral argument on the matters addressed in the written submissions. As contemplated in the Notice of Hearing issued on August 17, 2012, the hearing respecting NQCLs was held in Fort McMurray on October 23, 2012. Details of the matters to be considered in the hearing were set out in a letter from the Panel's counsel dated October 19, 2012 (filed in the registry as document #1210). All of the parties who filed written submissions concerning the NQCLs participated in the oral hearing, except for FMFN. When the hearing session concluded, the Panel stated that it would provide decisions regarding the further consideration by the Panel of the two remaining NQCLs. This letter contains the Panel's decisions. To ensure its decisions are issued prior to the commencement of the main hearing on October 29, 2012, the Panel has not set out in this letter the detailed positions of the parties but has instead referred to some aspects of the parties' positions within the Panel's reasons. Although the Panel has not included a summary of each party's position, the Panel assures participants that it has considered all of the written and oral submissions provided in this part of the proceeding. The attachment to this letter decision lists the submissions that the Panel considered.

The Panel has made the following decisions in relation to the NQCLs filed by the ACFN and MNA.

1. The Panel does not have an express grant of statutory authority to consider the adequacy of Crown consultation in relation to the Project. Although the Panel is empowered by statute to

consider questions of constitutional law relating to the matters before it in this proceeding or arising from its statutory mandate, the questions presented in the NQCLs do not arise from either. As a result, the Panel does not have jurisdiction over the questions of constitutional law raised in ACFN's and MNA's NQCLs.

2. Even if the Panel had jurisdiction over the questions of constitutional law raised in the NQCLs, it would be premature for the Panel to make a finding on the adequacy of Crown consultation and make a decision in reliance on that finding (if the Panel concluded consultation was inadequate). The Crown conduct that gives rise to the duty to consult will continue after this proceeding is completed and after the Panel has issued its report. The Panel's report will inform the Crown's subsequent decisions about constitutional consultation and opportunities will exist for the Crown and Aboriginal groups to continue the consultation process. When that process is completed, and if the Crown's decision is that constitutional consultation is adequate, the Aboriginal groups will be entitled to challenge the Crown's decision if they are not satisfied with the results of that process.

3. Notwithstanding that the Panel has decided that it cannot consider the questions of constitutional law because it does not have jurisdiction to do so, it will consider all the evidence and argument relating to the potential effects of the Project on Aboriginal groups and individuals in accordance with the terms of the *Amended Agreement To Establish a Joint Review Panel for the Jackpine Mine Expansion Project* ("the Agreement").

The reasons for the Panel's decisions are set out below.

The Questions of Constitutional Law

The ACFN's NQCL posed the following questions:

> 1. Has the Crown in right of Alberta discharged the duty to consult and accommodate ACFN with respect to the potential adverse effects of the Project on ACFN's Treaty Rights, as mandated by the Treaty and s. 35 of the *Constitution Act, 1982*?
>
> 2. Has the Crown in right of Canada discharged the duty to consult and accommodate ACFN with respect to the potential adverse effects of the Project on ACFN's Treaty rights, as mandated by the Treaty and s. 35 of the *Constitution Act, 1982*?

The ACFN requested the following relief:

> 1. That the Joint Review Panel, sitting as the Energy Resources Conservation Board, deny the project for approval because the Crown in right of Alberta and/or the Crown in right of Canada has failed to adequately discharge the duty to consult and accommodate the ACFN;
>
> 2. A finding that the Project is not in the public interest and cannot be authorized unless and until the Crown has fully discharged its duties to consult

and accommodate ACFN with respect to potential adverse effects on its Treaty Rights (as described below);

3. In the alternative, a deferral of the decision on the Project for approval until each of the Crown in right of Alberta and the Crown in right of Canada adequately consult the ACFN regarding the potential impacts of the Project on the ACFN's Treaty rights and accommodates the same; and

4. That the Joint Review Panel, pursuant to the *Canadian Environmental Assessment Act, 2012*, recommend to the Minister that the Project will cause significant adverse impacts on ACFN's Treaty Rights and culture that are not mitigated and cannot be justified unless and until the Crowns and each of them has fully discharged their duties to consult and accommodate ACFN with respect to potential adverse effects on its Treaty Rights (as described below).

From paragraph 7b) of its written submission dated October 1, 2012, the Panel interprets the MNA's question as follows:

> 1. Has the Government of Alberta upheld its duty to consult with the Métis people whose rights will be impacted by this project? The MNA asserts that these rights exist and are and have been asserted by the MNA Region 1 throughout this process. These submissions herein provide the Notice of Question of Constitutional Law and associated information required in accordance with Schedule 2 of the *Administrative Procedures and Jurisdiction Act, Designation of Constitutional Decision Makers Regulation,* A.R. 69/2006 including the aboriginal right to be determined.

MNA requested the following relief in paragraphs 99 and 100 of its submission:

99. A finding that:

a) The evidence shows that there is a credible assertion that the Aboriginal Rights of the Métis in the area will be impacted by this Application;

b) The Government of Alberta has not engaged in any consultation with any Métis people with respect to this Application; and

c) Shell has not fulfilled the Terms of Reference of the Government of Alberta or the Joint Review Panel and therefore cannot be said to have relieved the Crown of their obligation to consult and/or accommodate the impacts to the Aboriginal rights asserted.

100. Denial of the application on the basis that the impact on the Aboriginal Rights of the Métis people in the area has not been addressed in the Application.

The Panel considers that the findings requested in paragraph 99 of the MNA submission are actually the facts the MNA proposed to show in evidence in order to support the request for relief that appears in paragraph 100.

Each NQCL asks the Panel to find that the Crown has a duty to consult with the Aboriginal people identified, and to find that the Crown has not met that duty. The duty to consult and accommodate is a legal duty with unique aspects that distinguish it from other Aboriginal rights. The duty arises from the Honour of the Crown and always rests with the Crown, although the Crown may delegate procedural aspects of consultation. Crown consultation is part of a process of fair dealing and reconciliation that flows from the historical relationship between the Crown and Aboriginal people[1].

The duty is owed to Aboriginal communities as a whole and not to individual Aboriginal persons[2]. It arises when the Crown has knowledge, real or constructive, of the potential existence of an aboriginal right, title or interest and contemplates Crown conduct that might adversely affect it. When assessing potential impacts to aboriginal claims or rights, the impacts must be causally linked to the proposed Crown conduct or decision. Although that assessment may include a consideration of cumulative effects based on the existing state of affairs, addressing past wrongs is not one of the purposes of Crown consultation[3].

The scope of the duty to consult is based on a preliminary assessment of the strength of the claim or right asserted and the extent of the alleged infringement. Where the perceived breach is less serious or relatively minor, the content of the duty will be at the lower end of the scale, for example, mere notice may be sufficient. If a strong *prima facie* case for the claim is established and the potential infringement is of higher significance, deep consultation that is aimed at finding a satisfactory solution may be required; however, the duty to consult does not confer a veto power on Aboriginal groups[4].

Adequacy of the NQCLs

No concerns were raised in relation to the form, content, filing or service of ACFN's NQCL.

In relation to MNA's NQCL, Alberta raised a number of concerns, including that:

- strict compliance with the notice requirements of the *Administrative Procedures and Jurisdiction Act* ("*APJA*") is required;
- the MNA NQCL does not contain a clear statement of a question of constitutional law; and
- contrary to the requirements of the *Designation of Constitutional Decision Makers Regulation* ("Regulation"), the NQCL does not provide the substance of the evidence of all of the MNA's proposed witnesses. Alberta stated that this defeats the purpose of the

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[1] *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73; *Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage)*, 2005 SCC 69.

[2] *Newfoundland and Labrador v. Labrador Métis Nation*, 2007 NCLA 75; leave to appeal to SCC refused Docket 32468 (May 29, 2008), 2008 CanLII 32711 (SCC).

[3] *West Moberly First Nations v. British Columbia (Chief Inspector of Mines)*, 2011 BCCA 247; leave to appeal to SCC refused Docket 34403 (February 23, 2012), 2012 CanLII 8361 (SCC).

[4] *Haida Nation, ibid.*

notice requirement, which is to allow the Attorney General of Alberta to know the case it has to meet and the testimony that will be heard from witnesses. Alberta also stated that it is impossible for Alberta to prepare its submissions in response to the NQCL without having the substance of the MNA's witnesses' testimony.

During oral submissions, Alberta advised that it was not insisting on a strict technical approach to the NQCL and was therefore not asking that the MNA's NQCL be struck. Rather, it requested that the Panel not permit any witnesses for whom the MNA had not provided a will-say statement to testify.

The MNA's position was that, given the volume of materials it provided and the information provided regarding its witnesses, its NQCL complied in substance with the provisions of the *APJA*. It also stated that the responders to its NQCL suffered no prejudice as a result of the form or content of its NQCL. During oral submissions, MNA's counsel provided Alberta with one additional will-say statement and advised that 5 of the 11 MNA witnesses for whom a will-say statement was not submitted would not be testifying. The MNA further took the position that, given that certain MNA witnesses are Elders, there was no requirement to provide a written submission as to the content of their evidence.

The Panel is satisfied that the provisions of the *APJA* apply to its ability to consider the questions of constitutional law. In particular, section 12 of the *APJA* and Schedule 2 of the Regulation require the filer of a NQCL to provide to the Minister of Justice and Attorney General of Alberta and the Attorney General of Canada certain information including:

- the grounds to be argued and reasonable particulars of the proposed argument, including a concise statement of the constitutional principles to be argued, references to any statutory provision or rule on which reliance will be placed and any cases or authorities to be relied upon;
- the law in question, the right or freedom alleged to be infringed or denied, or the aboriginal or treaty right to be determined, as the case may be;
- the material and documents that will be filed with the decision-maker; and
- a list of witnesses intended to be called to give evidence before the decision-maker and the substance of their proposed testimony. (underlining added by the Panel)

The provisions of the *APJA* and the Regulation are mandatory. The Panel has no discretion to cure defects in NQCLs provided to Alberta, Canada or any other parties to the proceeding entitled to the notice. The legislation is clear that a notice meeting all of the foregoing criteria must be given to the Panel, Shell, Alberta and Canada.

The Panel accepts that the purpose of the notice requirement is to ensure that the Panel, the proponent, and the governments of Alberta and Canada can be informed of the substance of the constitutional questions being raised so that they can respond to them appropriately. A failure to provide the required information is more than a technical deficiency that may have the potential to create prejudice to Shell, Alberta and Canada and any other parties responding to the NQCL. It is a contravention of the *APJA* that deprives the Panel of any jurisdiction it might otherwise have to consider the constitutional question posed in the NQCL.

The Panel finds that for those MNA witnesses for whom a will-say statement or other statement of his or her intended testimony was not provided with the NQCL, the notice requirement of the *APJA* not met. This is the case even if those witnesses are MNA Elders: the *APJA* notice requirement makes no distinction between expert witnesses and laypersons or persons having traditional, cultural or other special knowledge. As a result, the Panel would not permit those witnesses to give evidence in relation to the question of constitutional law posed in the MNA's NQCL.

In all other respects, the Panel is satisfied that the MNA's NQCL provides the information required by the legislation such that the notice requirement in the *APJA* is met and there is no apparent prejudice to Alberta, Canada or Shell. Notwithstanding that finding, the Panel would like to provide additional comments that may assist the MNA and other parties participating in proceedings in which constitutional questions of law arise. Subsection 12(4) of the *APJA* states "the notice under subsection (1) must be in the form and contain information provided for in the regulations". Schedule 2 of the Regulation provides a template form of notice. It is in the nature of a "fill in the blanks" form that would be understandable and useful to any person, with or without legal training. The form also provides directions on what information is to be included in the Details of Argument. The Panel strongly encourages anyone intending to file a NQCL to slavishly follow the template notice that is provided in the Regulation. Doing so practically eliminates any possibility that a filer's notice may be found to be deficient by a designated decision-maker.

Application of the APJA to the NQCLs

The Panel addressed this matter in its letter of October 19, 2012, concerning the participation of the Non-status Fort McMurray/Fort McKay First Nation and the Clearwater River Paul Cree Band #175, but it bears repeating in this decision. Under the terms of the Agreement, the Panel is directed to conduct its review in a manner that discharges the responsibilities of the Energy Resources Conservation Board ("ERCB" or "Board") and the requirements set out in the *Canadian Environmental Assessment Act, 2012* ("*CEAA, 2012*") and the Terms of Reference appended to the Agreement. The ERCB is a "designated decision maker" as defined in subsection 10(c) of the *APJA*. As a result, Part 2 of the *APJA* applies to the Panel when it discharges its responsibilities as a division of the ERCB.

Can the Panel Consider Questions of Constitutional Law?

In *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*[5], (*Carrier Sekani*) cited by all the participants in this proceeding, the Supreme Court of Canada summarized the law relating to an administrative tribunal's power to consider constitutional issues. The Court stated:

> [68] ..., tribunals are confined to the powers conferred on them by the legislature: *Conway*. We must therefore ask whether the *Utilities Commission Act* conferred on the Commission the power to consider the issue of consultation, grounded as it is in the constitution.
>
> [69] It is common ground that the *Utilities Commission Act* empowers the Commission to decide questions of law in the course of determining whether the 2007

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[5] 2010 SCC 43.

> [Energy Purchase Agreement (EPA)] is in the public interest. The power to decide questions of law implies a power to decide constitutional issues that are properly before it, absent a clear demonstration that the legislature intended to exclude such jurisdiction from the tribunal's power (*Conway*, at para. 81; *Paul v. British Columbia (Forest Appeals Commission)*, 2003 SCC 55, [2003] 2 S.C.R. 585, at para. 39). "[S]pecialized tribunals with both the expertise and authority to decide questions of law are in the best position to hear and decide constitutional questions related to their statutory mandates": *Conway*, at para. 6.
>
> (underlining added by the Panel)

Similar to the British Columbia Utilities Commission ("BCUC") in *Carrier Sekani*, the ERCB is authorized by the legislation establishing its powers, duties and functions to decide questions of law. That is implied from several provisions of the *Energy Resources Conservation Act* ("*ERCA*"), in particular section 26, which requires the ERCB to decide what legal rights arise that may entitle an individual to a hearing before the Board, and section 41 which provides for a right of appeal from a Board decision on a question of jurisdiction or on a question of law. The Panel therefore concludes that is empowered, as the ERCB, to decide constitutional issues that are properly before it unless there is a clear demonstration that the legislature intended to exclude such jurisdiction from the ERCB's powers.

Pursuant to the Regulation, the ERCB is authorized to decide all questions of constitutional law. As a result, Part 2 of the *APJA* does not displace any of the ERCB's constitutional authority that is indicated under a *Paul* or *Conway* analysis (assuming the section 12 *APJA* notice requirement is met). But the *APJA* does not enlarge that authority either. The Panel therefore finds that it has jurisdiction to decide the questions of constitutional law raised in the NQCLs if the questions relate to matters that are properly before the Panel or are related to the Panel's statutory mandate.

The Duties Relating to Crown Consultation

In *Carrier Sekani*, the Supreme Court of Canada stated that government could delegate the duties associated with section 35 consultation to an administrative tribunal.

> [56] The legislature may choose to delegate to a tribunal the Crown's duty to consult. As noted in *Haida Nation*, it is open to governments to set up regulatory schemes to address the procedural requirements of consultation at different stages of the decision-making process with respect to a resource.
>
> [57] Alternatively, the legislature may choose to confine a tribunal's power to determinations of whether adequate consultation has taken place, as a condition of its statutory decision-making process.
>
> [58] Tribunals considering resource issues touching on Aboriginal interests may have neither of these duties, one of these duties, or both depending on what responsibilities the legislature has conferred on them. Both the powers of the tribunal to consider questions of law and the remedial powers granted it by the legislature are relevant considerations in determining the contours of that tribunal's jurisdiction: *Conway*. As such, they are also

> relevant to determining whether a particular tribunal has a duty to consult, a duty to consider consultation, or no duty at all.
>
> (underlining added by the Panel)

No party stated that the Panel had an express grant of statutory power to consider the adequacy of Crown consultation; in fact, Alberta stated that the Legislature of Alberta had not granted the Panel jurisdiction to consider and assess Alberta's consultations as part of the Project application process. The Panel agrees that any statutory authority it has to consider the question has not been expressly granted to it, and therefore must arise within the "contours of [the Panel's] jurisdiction".

Although the ACFN stated in its written submission that the Panel itself is a Crown entity, counsel for ACFN stated in his oral submissions that the Panel remained an independent, quasi-judicial body similar to the BCUC in *Carrier Sekani*. Counsel for MNA stated that the Panel's exercise of its authority is government action. Notwithstanding those submissions, no party argued that the Panel was the Crown and was therefore required to consult with Aboriginal groups.

The Panel agrees with Canada and Alberta that a Canadian Environmental Assessment Agency review panel does not exercise a decision-making function. It performs an environmental assessment and provides a report to the federal Minister of the Environment that must be taken into account for the purposes of the federal government's decisions with respect to the environmental assessment as well as in respect of federal approvals and permits that are needed for a project to proceed. A review panel is neither the Crown nor an agent of the Crown to which the duty to consult is delegated.

Counsel for Alberta stated that Alberta addresses its consultation obligations through Policy and Guidelines that are administered by Alberta government departments (with procedural aspects delegated to project proponents). The Panel also notes that the decision of the Court of Appeal of Alberta in *Dene Tha' First Nation v. Alberta (Energy and Utilities Board)*[6], makes it clear that the ERCB is not the Crown and does not have the duty to consult.

> [24] It is now conceded to us that neither the energy company nor the Board has or had any duty in law to consult with those holding aboriginal or treaty rights. That concession is plainly correct today, though it may have been unclear for a time. At one point in oral argument, there was a stray reference to the Board as an "emanation" of the Crown, a characterization not argued elsewhere, and in our view inaccurate. In the 1930s the Privy Council condemned that term as vague and apt to mislead.

The Panel states, in case there is any uncertainty over the question, that the ERCB is not the Crown and does not have the Crown's duty to consult, whether as an agent of the Crown or pursuant to some other delegation. As a result, the Panel's jurisdiction over the question of the adequacy of Crown consultation cannot arise from this aspect of the duty to consult.

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[6] 2005 ABCA 68.

The Duty to Consider Consultation

In *Carrier Sekani*, the Supreme Court restated the test from *Haida Nation* that sets out the circumstances in which the duty to consult arises.

> [79] A duty to consult arises, as set out above, when there is: (a) knowledge, actual or constructive, by the Crown of a potential Aboriginal claim or right, (b) contemplated Crown conduct, and (c) the potential that the contemplated conduct may adversely affect the Aboriginal claim or right.

The applicant in *Carrier Sekani*, B.C. Hydro, was an agent of the Crown and therefore obliged to uphold the honour of the Crown, including discharging the duty to consult (if the duty arose). Having regard for this, the British Columbia Court of Appeal urged the BCUC "to grasp the nettle and decide the consultation dispute".[7] On appeal, the Supreme Court of Canada agreed that the BCUC had the power to consider whether adequate consultation with Aboriginal groups had taken place but it overturned the Court of Appeal's decision on the basis that the issue of consultation did not arise from B.C. Hydro's application. The Court concluded that the only Crown conduct arising from the decision that was before the BCUC was B.C. Hydro's intention to purchase power as reflected in the proposed Energy Purchase Agreement. As a result, the Court decided that the question of the adequacy of Crown consultation did not arise from the application filed by B.C. Hydro and was not within the BCUC's mandate.

> [84] It was argued that the Crown breached the rights of the CSTC when it allowed the Kenney Dam and electricity production powerhouse with their attendant impacts on the Nechako River to be built in the 1950s and that this breach is ongoing and shows no sign of ceasing in the foreseeable future. But the issue before the Commission was whether a fresh duty to consult could arise *with respect to the Crown decision before the Commission*. The question was whether the *2007 EPA* could *adversely* impact the claim or rights advanced by the CSTC First Nations in the ongoing claims process. The issue of ongoing and continuing breach was not before the Commission, given its limited mandate, and is therefore not before this Court.
>
> (underlining added by the Panel)

In its October 19, 2012 letter to the parties that filed or responded to the NQCLs, the Panel asked parties to identify the contemplated Crown conduct that gives rise to the duty to consult. Counsel for ACFN stated that this was an academic question since Alberta and Canada had both accepted that the duty was triggered and existed. However, he also stated that the entire amendment approval process for the Project is Crown conduct that triggered the duty as early as the date that Shell proposed Terms of Reference for its Environmental Impact Assessment. ACFN argued that the Panel's decision would be a milestone decision because the Panel would decide *if* the Project should be approved, not *how* the Project should be approved. He stated that subsequent permitting decisions would be limited to deciding what conditions to attach to various approvals that might follow. ACFN also argued, albeit in the alternative, that the Panel's approval process is Crown conduct because it is a Crown-established process for project approval. ACFN stated that the Panel's amendment approval decision is Crown conduct that triggers the duty to consult.

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[7] *Carrier Sekani Tribal Council v. British Columbia (Utilities Commission)*, 2009 BCCA 67, at para. 56.

ACFN's counsel emphasized that this did not mean the Panel was acting as a Crown agent but that it remained an independent, quasi-judicial body similar to the Commission in *Carrier Sekani*. In response to the submissions of Canada, Alberta and Shell, the ACFN reiterated that the duty to consult in relation to the Project was triggered long ago and that it did not make sense for the Panel to consider consultation obligations on only a forward-looking basis. He urged the Panel to consider what had happened in the past and to decide the question of consultation adequacy.

The MNA stated that it adopted the submissions of the ACFN on the question of the Panel's jurisdiction over the NQCLs. The MNA also stated that any exercise of statutory authority is a government action. Its counsel argued that a decision of the Surface Rights Board had established that the ERCB is an expropriating body, and that expropriation is unquestionably a government action.

Alberta confirmed that it has a duty to consult relative to the Project. Alberta disagreed, however, that the Panel had the jurisdiction to consider the adequacy of Crown consultation. Alberta stated that Crown decisions have already been made in relation to the Project and that those could potentially be challenged for inadequate consultation. Alberta argued that there is no contemplated Crown conduct before the Panel and that neither the Panel (as the ERCB) nor the proponent is the Crown. Alberta stated that in order for the Panel to be able to consider Crown consultation, it would have to have jurisdiction over the parties, the subject matter, and the remedies being sought. In Alberta's view, none of those requirements are met in this case.

Alberta stated that in addition to the Panel's approval of the Project application filed with the ERCB, the Project requires approvals from Alberta under the *Environmental Protection and Enhancement Act*, *Water Act*, and *Public Lands Act* before it can proceed, and that the Panel has no decision-making authority regarding those Alberta approvals. Alberta submitted that the processes for acquiring the Alberta approvals provided additional opportunities for Aboriginal consultation after the Panel issues its report. Alberta further stated that although this proceeding is about Shell's application, the Crown's efforts to consult and respond to the concerns of First Nations are much broader than the application and encompass other processes and avenues to mitigate impacts. Alberta argued that the Panel's hearing is one of the tools that allows the Crown to better understand the Project, and in fact is part of Alberta's consultation process. Alberta submitted that a decision by the Panel on the adequacy of Crown consultation would therefore be premature and unnecessary.

Canada stated that in addition to numerous provincial approvals for the Project (which Canada listed on page 8 of its written submission dated October 15, 2012), federal approvals are required under the *Fisheries Act*, as amended, and the *Navigable Waters Protection Act*, as amended. Canada described the sequencing of events that might lead to approval of the Project by Canada and Alberta, and stated that the Panel is part of a planning process that informs all federal and provincial Crown decisions relating to the Project. Canada also stated that Crown decisions about the adequacy of Aboriginal consultation and accommodation *should* be informed by the Panel's findings about project impacts on actual or asserted Aboriginal or Treaty rights. This requires that any Crown decision about sufficiency of consultation and accommodation be made after the Panel's report is issued and before federal decision-making occurs under *CEAA, 2012* or other federal statutes. Canada submitted that the Panel's proceeding did not represent an appropriate time for consultation adequacy to be assessed, given the capacity and intention of the Crown to address the concerns raised by Aboriginal groups in the future.

Similar to Alberta and Canada, Shell described the various federal and Alberta government approvals that would need to be considered and dispositioned after the Panel had issued its decisions and recommendations. Shell stated that it was premature for the Panel to consider the adequacy of Crown consultation because many of the decisions needed to allow the Project to proceed would not be made until well after the Panel's report was issued.

The Panel has considered the arguments provided by parties on the question of what is the Crown conduct that gives rise to the duty to consult. The Panel has concluded that there is no Crown conduct arising from the matters that are before the Panel so as to trigger the duty to consult in relation to those matters. Alberta and Canada acknowledged that there is and will continue to be an obligation on the Crown to consult and accommodate in relation to the Project. But that duty is triggered by other circumstances, including federal and Alberta government decisions on applications that are not before this Panel. The Crown in right of Alberta and the Crown in right of Canada are not before this Panel, nor is the Panel empowered to direct the Crown to perfect consultation with Aboriginal groups if the Panel were to find that consultation was inadequate. With reference to the *Conway* decision, the Panel does not have the ability to grant a remedy that would require the Crown, which has the duty to consult, to fulfill its consultation obligations to ACFN and MNA. The Panel's decision-making authority is limited to making a determination as to whether the Project is in the public interest and dispositioning the Project application accordingly. The Panel may deny the Project application or approve it with or without conditions designed to ensure the Project meets applicable regulatory requirements. Those conditions and any other requirements imposed by the Panel will govern Shell's conduct, but will not and cannot authoritatively direct the conduct of the Crown.

In addition, the Panel accepts the representations from Alberta, Canada and Shell that Crown consultation in relation to the Project is not complete. It would be premature for the Panel to make a decision on the Project application in reliance on a finding that consultation has been inadequate when the Crown has acknowledged that it has a duty to consult and stated that it will continue to address this duty after this proceeding is ended. The Panel is required or authorized under the Agreement to receive a broad range of information about the potential effects of the Project on Aboriginal groups and individuals, and to include that information in its report. Alberta and Canada have each stated that the information contained in the Panel's report will be considered and used by them to continue the consultation process to its conclusion. That is an appropriate use of the Panel's report, and is a use that is recognized in law as a legitimate part of the Crown's consultation process[8]. The appropriate time for consultation adequacy to be decided is when the Crown has concluded its consultation process. At that time, Aboriginal groups can decide if they are satisfied with the results of the consultation process or if they wish to seek a remedy to enforce the Crown's obligations to them.

ACFN also stated in oral argument that the Panel cannot make a decision that is inconsistent with the *Constitution Act, 1982*. The argument, as the Panel understands it, is that by potentially approving the Project application without considering whether Crown consultation in relation to the Project is adequate, the Panel may be condoning or permitting the Crown to breach its duty to the ACFN, and that result is not in the public interest. In the Panel's view, the Federal Court of Appeal considered a similar argument in *Standing Buffalo Dakota First Nation v. Enbridge Pipelines Inc.*[9]. In that decision, the Court found that the National Energy Board ("NEB") did not have a duty to undertake a *Haida* analysis or decide if the Crown met the duty to consult with the Aboriginal appellants. The Court described the argument in that case as follows:

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[8] *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74.

> [38] The appellants further argue that in the context of an application for a Section 52 Certificate, the NEB must "have regard to all considerations that appear to it to be relevant", as specifically stated in section 52 of the NEB Act. And, according to the appellants, whether the Crown has, and has satisfied, a *Haida* duty, are matters that are relevant to, and therefore must be addressed by, the NEB. A failure to do so, their argument continues, would result in breach by the NEB of its obligation to make its decisions in accordance with the dictates of the Constitution.

The Court decided that the NEB acted constitutionally, when it stated:

> [40] First, as noted above, the decision in *Quebec (Attorney General) v. Canada (National Energy Board)* establishes that in exercising its decision-making function, the NEB must act within the dictates of the Constitution, including subsection 35(1) thereof. In the circumstances of these appeals, the NEB dealt with three applications for Section 52 Certificates. Each of those applications is a discrete process in which a specific applicant seeks approval in respect of an identifiable Project. The process focuses on the applicant, on whom the NEB imposes broad consultation obligations. The applicant must consult with Aboriginal groups, determine their concerns and attempt to address them, failing which the NEB can impose accommodative requirements. In my view, this process ensures that the applicant for the Project approval has due regard for existing Aboriginal rights that are recognized and affirmed in subsection 35(1) of the Constitution. And, in ensuring that the applicant respects such Aboriginal rights, in my view, the NEB demonstrates that it is exercising its decision-making function in accordance with the dictates of subsection 35(1) of the Constitution.
>
> (underlining added by the Panel)

The Court added that although the NEB correctly decided it was not required to determine whether the Crown was under and had discharged a duty to consult before approving pipeline project applications, that decision did not preclude adjudication of the consultation issues by a court of competent jurisdiction. In fact, the Court noted that the *Haida* and *Paul* decisions indicated that aboriginal groups should seek their recourse in the courts in such circumstances.

In accordance with the Agreement, the Panel has provided a number of opportunities for Aboriginal groups and individuals to provide comment on and participate in this proceeding to consider the Project application and environmental assessment. The ACFN and MNA have filed substantial written submissions that indicate they will participate extensively in the oral hearings. The Panel believes that its hearing process will assist both the Crown (which owes the duty to consult) and the Aboriginal groups (who are entitled to that consultation) to move towards a resolution of their differences. It will also assist the Panel to understand the potential effects of the Project on Aboriginal people. If the Panel decides that the Project is in the public interest, that understanding will allow it to disposition the Application appropriately by imposing measures within its authority that are intended to mitigate any adverse impacts from the Project on Aboriginal groups and individuals.

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[9] 2009 FCA 308; leave to appeal to SCC refused Docket 33481 (December 2, 2010), 2010 CanLII 70764 (SCC).

The Panel has an additional comment in relation to the NQCL filed by the MNA. In its submissions, Alberta expressed concern that the question of constitutional law presented by the MNA was overly broad. Rather than identifying specific rights-bearing aboriginal collectives, it claimed rights in relation to Métis people generally. The Board understands that the scope and extent of Métis rights in Alberta is not as well defined as those of recognized First Nations. Although the duty to consult requires only a preliminary assessment of the strength of an Aboriginal claim or right, there must be some reference point available to do that assessment. In the decision *Lax Kw'alaams Indian Band v. Canada (Attorney General)*[10], the Supreme Court of Canada advised against allowing a regulatory proceeding to venture into a free-ranging inquiry into the historical grounds of modern Aboriginal rights.

> [11] The courts (including this Court) have long urged the negotiation of Aboriginal and treaty claims. If litigation becomes necessary, however, we have also said that such complex issues would be better sorted out in civil actions for declaratory relief rather than within the confines of regulatory proceedings. In a fisheries prosecution, for example, there are no pleadings, no pre-trial discovery, and few of the procedural advantages afforded by the civil rules of practice to facilitate a full hearing of all relevant issues.

The Panel believes that the question of constitutional law posed by the MNA, and the evidence the MNA proposed to substantiate its position on the question, presents a real prospect that this proceeding would venture into the kind of inquiry the Supreme Court of Canada cautioned regulators to avoid.

The Effect of the Agreement on the Panel's Jurisdiction over the Question

ACFN, and to a more limited extent MNA, argued that Articles 6.3 or 6.4 of the Agreement, or both of them together, conferred jurisdiction over the questions or indicated that the Panel had that jurisdiction. That is not the Panel's understanding or interpretation of the Agreement. Generally speaking, the Agreement provides a broad mandate for the Panel to receive information about the potential impacts of the Project on Aboriginal groups and individuals, to assess the significance of those impacts, and to include in its report the Panel's findings on those matters. Article 6.3 of the Agreement does not expand the Panel's mandate, it provides a limit on what the Panel is required to do under the Agreement by specifically stating that the Panel is *not required* to make any determinations as to the scope of the Crown's duty to consult an aboriginal group or whether the Crown has met a duty to consult or accommodate. Article 6.4 of the

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[10] 2011 SCC 56.

Agreement simply confirms that the Panel is subject to Part 2 of the *APJA* and does not expand or reduce the Panel's mandate under the Agreement.

As previously stated herein, the Panel has concluded that any jurisdiction it may have over the questions of constitutional law posed in the NQCLs must be derived from statute (*Conway*). The Agreement, regardless of its terms, is incapable of conferring jurisdiction on the Panel unless that jurisdiction is rooted in a statutory grant of authority.

Yours truly,

Jim Dilay
Joint Review Panel Chair

APPENDIX

Submissions Relating to the Notices of Question of Constitutional Law

CEAA Registry #	Date Filed	Party and Document Name
461	October 1, 2012	MNA NQCL and Written Submission
465	October 1, 2012	ACFN NQCL
536	October 9, 2012	Alberta letter to Panel "Preliminary Submissions"
537	October 9, 2012	ACFN letter to Panel requesting opportunity to respond to Alberta's preliminary submissions
605	October 11, 2012	Shell letter to Panel with submissions on NQCLs
772	October 12, 2012	ACFN Erratum to its NQCL
904	October 15, 2012	Shell Written Submission on NQCLs
905	October 15, 2012	Canada Written Submission on NQCLs
907	October 15, 2012	Alberta Written Submission on NQCLs
913	October 16, 2012	Alberta Correction to its Written Submission on NQCLs
1036	October 17, 2012	ACFN Written Reply Submission
1037	October 17, 2012	MNA Written Reply Submission

APPENDIX 5 LIST OF AER CONDITIONS

Condition 1 - The Panel requires Shell to submit a lease boundary update five years before any disturbance along a particular common lease boundary, unless some other period is stipulated by the AER upon application by Shell. (Mining section)

Condition 2 - The Panel requires Shell to provide, for AER approval, a geotechnical interaction assessment of the North OBDA, the MRDC, and the pit wall before any earth work begins at the interaction area of the North OBDA, the MRDC, and the pit wall. (Mining section)

Condition 3 - The Panel requires Shell to provide an update on its plans for dewatering and mining through the PCA five years before mining operations reach the PCA. The update is to include a description of any changes that Shell intends to make when dewatering and mining the PCA as a result of Shell's experience at Phase 1. (Surficial Deposit Dewatering and Basal McMurray Depressurization section)

Condition 4 - The Panel requires Shell to provide an updated geohazard management plan as a part of its annual mine plan submission, commencing with the expansion mining operations. (Devonian Geohazard section)

Condition 5 - The Panel requires Shell to provide a bitumen recovery improvement plan for AER approval two years before construction. This plan must include details of all bitumen recovery improvements Shell intends to incorporate into its expanded Jackpine Mine plant (i.e., Phase 1 and the Project) design and mine plan. (Bitumen Recovery section)

Condition 6 - The Panel requires Shell to provide measurement plans for AER approval one year before the expanded Jackpine Mine plant start-up. These plans must include process and instrumentation diagrams, metering, sampling methods, analytical methods, and material balance procedures that satisfy AER measurement requirements. (Bitumen Recovery section)

Condition 7 - The Panel requires Shell to provide a commissioning and start-up plan for AER approval one year before the expanded Jackpine Mine plant start-up. (Bitumen Recovery section)

Condition 8 - The Panel requires that Shell must provide to the AER annually, on or before February 28, a calculation showing the amount of asphaltene rejection based on bitumen production, for the previous year of operation. (Asphaltene Rejection section)

Condition 9 - The Panel requires that on an annual average basis, the amount of asphaltene rejection must be limited to 10 mass per cent based on bitumen production. (Asphaltene Rejection section)

Condition 10 - The Panel requires as a condition of approval that on an annual average basis, Shell must limit site-wide solvent losses to not more than 4 volumes per 1000 volumes of bitumen production. This calculation must be based on site-wide losses and must include all solvent losses during all operating conditions. (Solvent Loss and Release of Untreated Froth Treatment Tailings section)

Condition 11 - The Panel requires as a condition of approval that Shell not discharge untreated froth treatment tailings to the tailings ponds or deposition locations. (Solvent Loss and Release of Untreated Froth Treatment Tailings section)

Condition 12 - The Panel requires Shell to provide a tailings management plan for AER approval, two years before the expanded project start-up. The plan must indicate that Shell will be compliant with *Directive 074* from the time of start-up. (Tailings section)

Condition 13 - The Panel requires Shell to have no fluid tailings at the end of the mine's life. (Tailings section)

Condition 14 - The Panel requires Shell to provide, within one year after expansion operations start-up, a post-construction, comprehensive sound monitoring survey of the Project, including measurements of expansion equipment, to verify compliance with *Directive 038*. (Noise section)

Condition 15 - The Panel requires Shell to provide an update to its NIA or complete a comprehensive sound monitoring survey to demonstrate compliance with *Directive 038* after its selection of new tier IV haul trucks. (Noise section)

Condition 16 - The Panel requires Shell to place low-permeability material against all water-bearing permeable zones exposed in the pits (including the PCA) to effectively reduce the potential for PAW to be released out of the backfill into those permeable zones. (Groundwater section)

Condition 17 - The Panel requires Shell to provide to the AER annual reports that describe: Shell's EPL research and development efforts for the proceeding year; Shell's plans and timelines to demonstrate the efficacy of EPLs within the next twenty years; and alternatives to passively treating water in EPLs. The report must include all of Shell's efforts and contributions toward collaborating to demonstrate a full-scale EPL. The first such report must be provided two years before the expanded Jackpine Mine plant start-up. (EPL section)

Condition 18 - The Panel requires Shell to provide, before beginning mining operations, a comprehensive economic assessment of feasible active water treatment options that Shell could implement to ensure that EPLs would meet water release criteria at closure. (EPL section)

Condition 19 - The Panel requires that Shell uses all necessary strategies, including watershed design, landscape contouring, and succession and revegetation planning to ensure the specified areas evolve into wetlands after closure. (Wetlands section)

Condition 20 - The Panel requires Shell to provide a report on the status of all stages of wetland reclamation on Phase 1 and the Project as part of its annual closure and reclamation report. The Panel also requires Shell to report any findings that makes or is aware of related to wetland reclamation research on disturbed oil sands mine sites. (Wetlands section)

Condition 21 - The Panel requires Shell to remove all benching on mine discard structures before final reclamation. (Reclamation section)

Condition 22 - The Panel requires that Shell provide, for AER approval, a detailed watershed design report for all mine structures one year before the final placement of reclamation material. (Reclamation section)

APPENDIX 6 LIST OF PANEL RECOMMENDATIONS

Recommendation 1 - The Panel recommends to ESRD that it require Shell to update its groundwater models when field data is available, and to inform affected stakeholders of any significant changes to model predictions resulting from incorporation of site-specific data. (Surficial Deposit Dewatering)

Recommendation 2 - The Panel recommends that the Government of Alberta conduct regional monitoring to verify model predictions. (Air Quality)

Recommendation 3 - The Panel recommends that the Governments of Canada and Alberta ensure that Shell conducts rigorous follow-up and monitoring on environmental effects of the Project related to climate change predictions and manages accordingly should predictions be incorrect. Specifically, the Panel recommends that the Government of Canada ensure that Shell conducts this follow-up and monitoring in relation to *CEAA, 2012* section 5 effects. (Climate Change Considerations in the Environmental Assessment)

Recommendation 4 - The Panel recommends that the Governments of Canada and Alberta ensure that Shell monitors environmental changes that result from climate change and undertakes adaptive management, as required, to respond to any unanticipated environmental effects that may affect the Project. (Change to the Project Caused by the Environment)

Recommendation 5 - The Panel recommends that the Governments of Canada and consider the precautionary cut-off flow approach to address impacts of water withdrawals during extreme low-flow conditions, and potential impacts on navigation. (Water Withdrawal from the Athabasca River)

Recommendation 6 - The Panel recommends that DFO, ESRD, the oil sands industry, and all other involved stakeholders, dedicate the necessary resources to ensure that Phase 2 of the *Water Management Framework for the Lower Athabasca River* is completed and implemented in a comprehensive manner by January 2016 as recommended in the P2FC Report. (Water Withdrawal from the Athabasca River, Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 7 - The Panel recommends that the Government of Alberta take immediate steps to ensure the comprehensive Muskeg River Water Management Plan is completed and approved to coincide with the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring*, expected to be implemented in 2015. (Diversion of the Muskeg River)

Recommendation 8 - The Panel recommends that ESRD include the following requirements for Shell to meet in any *EPEA* approval:

- provide contingency plans for EPL water that does not meet EPL release criteria, including active treatment options that Shell would implement to minimize impacts on receiving streams;
- validate the models used for predicting water quality in the EPLs and update mitigation plans accordingly as information on the PAW resulting from Shell's processes becomes available;
- provide a research schedule for the testing of EPL predictions and design features; and

- treat the entire volume of PAW resulting from the drying of MFT at the end of mine life. This treated PAW shall meet release criteria prior to placing it in the EPLs. (Use of End Pit Lakes)

Recommendation 9 - The Panel recommends that the Governments of Canada and Alberta include a requirement in any approval ensuring that Shell monitors fish tissue in the EPLs and, should the fish in an EPL exhibit elevated levels of contaminants, implement government-approved mitigation measures to prevent consumption of fish until they are safe to eat. (Use of End Pit Lakes)

Recommendation 10 - The Panel recommends that ESRD review the MFSP liability calculation and, if required, make corresponding adjustments to ensure that the total costs assigned to the treatment of contaminated soils and water are fully covered in the event EPLs do not perform as predicted. (Use of End Pit Lakes)

Recommendation 11 - The Panel recommends that ESRD include in any *EPEA* approval a requirement for Shell to report on adverse effects identified through monitoring and the corresponding mitigation measures implemented by Shell in accordance with its adaptive management plans. (Use of End Pit Lakes)

Recommendation 12 - The Panel recommends that ESRD consider the following when developing the EPL water release criteria:

- The criteria should be consistent with *LARP* water quality limits, which are based on provincial water quality guidelines.
- There are no provincial water quality guidelines for chemicals of concern such as, but not limited to, naphthenic acids and PAHs.
- The Governments of Alberta and Canada should work together to ensure EPL discharge would have no significant environmental effects on fish and fish habitat. (Use of End Pit Lakes)

Recommendation 13 - The Panel recommends that ESRD finalize and issue the EPL water release criteria in the early stages of the Syncrude BML demonstration test so that criteria can be incorporated into the water quality objectives necessary to determine the success of EPLs. (Use of End Pit Lakes)

Recommendation 14 - The Panel recommends that ESRD include in any *EPEA* approval a requirement that Shell recalibrate surface water quality models every five years with best available information and re-run simulations to validate predicted effects to the environment and ensure compliance with regulatory water quality guidelines. (Effects on Surface Water Quality)

Recommendation 15 - The Panel recommends that ESRD update the *Muskeg River Interim Management Framework for Water Quantity and Quality*'s current water-quality targets and limits to include naphthenic acids and PAHs to coincide with the *Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring* expected to be fully implemented in 2015. (Effects on Surface Water Quality)

Recommendation 16 - The Panel recommends that the Government of Canada ensure that Shell updates its models to account for sources of aerial deposition of mercury and PAH. Shell should provide the results to the Government of Canada and determine appropriate mitigation measures in consultation with the appropriate government departments, stakeholders and Aboriginal groups, if the predictions are different than what was presented to the Panel. (No Net Loss Plan)

Recommendation 17 - The Panel recommends that the Government of Canada require Shell to implement a monitoring plan to determine the level of mercury and other contaminants in the post-construction compensation lake and to identify any resulting contaminant increases in fish tissue. In the event that fish tissue contaminants exceed HC recommendations, the Panel recommends that DFO require Shell to implement the adaptive management program outlined in its NNLP. (No Net Loss Plan)

Recommendation 18 - The Panel recommends that the Government of Canada ensure Shell develops a specific timeline, including milestones, for when fishery resources provided through compensation works are publicly available. The proposed timeline should be incorporated into any *Fisheries Act* s. 35 authorization. (No Net Loss Plan)

Recommendation 19 - The Panel recommends that DFO require Shell to address the following matters in its final NNLP, and that DFO ensures that these matters are addressed, to its satisfaction, before issuing any *Fisheries Act* s. 35 authorization:

- consider climate change in fish habitat loss/gain calculations
- provide methodology selection criteria weightings for NNLP candidate compensation lake sites
- provide inputs and outputs associated with hydrologic modelling
- assess uncertainty associated with key components of the NNLP. (No Net Loss Plan)

Recommendation 20 - The Panel recommends that the Government of Canada provide specific benchmarks or thresholds for assessing significant effects to individual target fish species and on population diversity and abundance. The Panel also recommends that the Government of Canada ensure Shell incorporates these benchmarks or thresholds into its proposed adaptive management strategy. (No Net Loss Plan)

Recommendation 21 - The Panel recommends that DFO lead the CEA on downstream fish habitats and the monitoring. (No Net Loss)

Recommendation 22 - The Panel recommends that the government of Canada determine whether the habitat in the area of the Redclay Compensation Lake, where the compensation lake is proposed, is critical for the survival of the Ronald Lake Bison herd. (No Net Loss Plan)

Recommendation 23 - In the event the federal recovery strategy for bison includes critical habitat in the area affected by the NNLP, the Panel recommends that the Government of Canada and Shell work with other key stakeholders, including the Government of Alberta and Aboriginal groups that use the area for hunting wood bison, to modify the NNLP to avoid or minimize the effects on bison habitat. (No Net Loss Plan)

Recommendation 24 - The Panel recommends that the Governments of Canada and Alberta ensure that Shell evaluates the technical and economic feasibility for removing residual surface oil from tailings ponds. (Effects of Tailings Ponds on Migratory Birds)

Recommendation 25 - The Panel recommends that the Government of Canada consider if more information is required on the potential long-term effect to migratory bird reproductive success or behaviour as a result of exposure to tailings ponds along migration routes. The Government of Alberta should also consider if more information is needed on potential resulting health effects of consumption of hunted birds by local people. The Governments of Canada and Alberta, along with key stakeholders, should determine if studies are required to examine these issues. (Effects of Tailings Ponds on Migratory Birds, Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 26 - The Panel recommends that the Governments of Canada and Alberta ensure that Shell meets its commitments related to reclamation of wetlands, continues to research peatland reclamation strategies, and updates its reclamation plans accordingly. (Effects on Wetlands)

Recommendation 27 - The Panel recommends to ESRD that Shell be required to fully comply with the *LARP* biodiversity management framework once complete (Effects on Wetlands section)

Recommendation 28 - The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address the significant adverse project effects to wetlands and species at risk. (Effects on Wetlands),

Recommendation 29 - The Panel recommends that the Government of Alberta work toward timely completion of the *LARP* biodiversity management framework and that it include thresholds for old-growth forest loss to guide the development of future oil sands projects. (Effects on Old-Growth Forests)

Recommendation 30 - The Panel recommends to the Government of Alberta that to the extent possible, the biodiversity management framework should provide clear direction on the management objectives for old-growth forests in the Lower Athabasca planning region, identify acceptable levels of disturbance (thresholds) for different areas of the region that reflect the permitted land uses and management objectives for those areas, and provide specific direction on the role of conservation offsets within the planning region (Effects on Old-Growth Forests)

Recommendation 31 - The Panel recommends that the Governments of Canada and Alberta ensure that the best available research and development is used to improve reclamation of old growth forest habitat in the oil sands region in order to provide this habitat as soon as possible. (Effects on Old Growth Forests, and Effects on Wildlife and Their Habitat)

Recommendation 32 - The Panel recommends that before reclaiming any portion of the disturbed area, the Governments of Canada and Alberta ensure that Shell produce, in collaboration with the Aboriginal groups, a reclamation plan with the goal of optimizing the number and quality of traditional plants as well as the species distribution. (Effects on Traditional Plant Potential Areas)

Recommendation 33 - The Panel recommends that before construction, the Governments of Canada and Alberta ensure that Shell provides interested Aboriginal groups with full access to the Project lands to allow any valued traditional plants to be collected. (Effects on Traditional Plant Potential Areas)

Recommendation 34 - The Panel recommends that the Government of Alberta consider the need to identify and protect areas of significant traditional plant potential as part of the development of the biodiversity management framework under *LARP*. The Panel recommends that the Government of Alberta involve Aboriginal groups in the development of the *LARP* biodiversity management framework, particularly sections that are relevant to the protection of traditional plants. (Effects on Traditional Plant Potential Areas)

Recommendation 35 - The Panel recommends that if conservation offsets are required by the Governments of Alberta and Canada to mitigate project effects to wetlands or old-growth forests, that Alberta and Canada also consider involving Aboriginal groups in site selection to ensure, where feasible, these areas are also accessible and appropriate for the gathering of valued traditional plants.(Effects on Traditional Plant Potential Areas)

Recommendation 36 - The Panel recommends that, before other provincial and federal approvals are issued, the Governments of Canada and Alberta consider the need for conservation offsets to further mitigate project effects. The potential use of conservation offsets should include a consideration of the need to compensate for project effects to wetland-reliant species at risk and migratory birds that are wetland-reliant or species at risk.(Effects on Wildlife and Their Habitat)

Recommendation 37 - The Panel recommends that the Government of Alberta continue to work toward timely completion of the *LARP* biodiversity management framework and that it include wildlife-habitat-loss thresholds to guide the development of future oil sands projects. (Effects on Wildlife and Their Habitat)

Recommendation 38 - The Panel recommends that the Government of Canada ensure Shell develops and implements a follow-up program that requires collecting additional detailed baseline data on the distribution and abundance of species at risk and migratory birds in the LSA and drawdown zone, before any additional site disturbance, to corroborate Shell's HSI model predictions. The follow-up program should also monitor changes in local populations' habitat use during Project construction, operation and after closure, to further validate Shell's predictions. (Effects on Wildlife and Their Habitat)

Recommendation 39 - The Panel recommends that the Governments of Canada and Alberta ensure that the best available research and development is used to improve reclamation of wildlife habitat in the oil sands region in order to provide habitat for these species as soon as possible. (Effects on Wildlife and Their Habitat)

Recommendation 40 - The Panel recommends that until the biodiversity management framework and any associated thresholds are developed under *LARP*, the Governments of Canada and Alberta ensure that oil sands proponents consider thresholds and guidelines for assessing the significance of project effects that are available in existing documents, namely the *TEMF* and the Fort McMurray IRP. (Effects on Wildlife and Their Habitat)

Recommendation 41 - The Panel recommends that the Governments of Canada and Alberta, in collaboration with key stakeholders, collect baseline data and monitor and report on any future changes to the distribution and abundance of species at risk and migratory birds in the oil sands region. The data should be made available for future CEAs by proponents in the oil sands region as well as to Shell to allow it to confirm its EIA predictions. (Effects on Wildlife and Their Habitat)

Recommendation 42 - The Panel recommends the Governments of Canada and Alberta, industry, Aboriginal groups and other key stakeholders, work together to assess the return of wildlife to reclaimed oil sands affected landscapes. (Effects on Wildlife and Their Habitat)

Recommendation 43 - The Panel recommends the Government of Alberta, in consultation with the Government of Canada and interested Aboriginal groups in the oil sands area, produce a range plan for caribou in the designated critical habitat of the Richardson Range as soon as possible. This range plan should outline specific steps for providing immediate action to reverse the current level of disturbance, as prescribed in the federal recovery strategy. These steps should include direction for ensuring that indirect effects (e.g., increased predation resulting from nearby land clearing) on already significantly disturbed populations such as the Richardson Range are minimized or avoided. (Effects on Wildlife and Their Habitat)

Recommendation 44 - The Panel recommends that the Governments of Canada and Alberta ensure that Shell monitors the distribution and behaviour of caribou predators (namely wolves) and their usual prey (e.g., deer and moose) following clearing of the LSA to assess the potential indirect effects to the Richardson Range. (Effects on Wildlife and Their Habitat)

Recommendation 45 - The Panel recommends that the Government of Canada ensure Shell conducts further research and survey work to determine the extent to which caribou are using the LSA, and if they are to determine the number of individuals inhabiting the area and their connection to the caribou in the Richardson Range. The Panel recommends that the Government of Canada ensure that Shell works collaboratively with Aboriginal groups in carrying out this research. The results of this work should be provided to the Government of Alberta to help update caribou range plans in Alberta. (Effects on Wildlife and Their Habitat)

Recommendation 46 - The Panel recommends that the Government of Alberta work in cooperation with EC towards the expeditious completion of range plans for caribou in the oil sands region to ensure that immediate action occurs as prescribed in the federal recovery strategy. (Effects on Wildlife and Their Habitat)

Recommendation 47 - The Panel recommends that the Government of Alberta work with Aboriginal groups during development of the biodiversity management framework under *LARP* to specifically address issues related to caribou in the oil sands region. The Panel further recommends that during development of the biodiversity management framework, consideration be given to principles such as no net loss of caribou habitat, limiting linear disturbances in critical caribou habitat, and restoration of historical and present caribou ranges. (Effects on Wildlife and Their Habitat)

Recommendation 48 - The Panel recommends that the Government of Canada consult with Aboriginal groups to help inform the federal recovery strategy for wood bison and ensure its expeditious delivery. The Panel also recommends that critical habitat for bison be identified in the federal recovery strategy to provide context for decisions on future oil sands development in the oil sands region. (Effects on Wildlife and Their Habitat)

Recommendation 49 - The Panel recommends that the Government of Alberta include updated management objectives for moose for the Lower Athabasca planning region in the biodiversity management framework being developed under *LARP*. (Effects on Wildlife and Their Habitat)

Recommendation 50 - The Panel recommends that the Government of Alberta develop and implement a program to monitor the health and long-term sustainability of moose populations in the Lower Athabasca region, either as part of the biodiversity management framework or as part of other monitoring initiatives currently being developed and implemented. (Effects on Wildlife and Their Habitat, Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 51 - The Panel recommends that the Government of Alberta work with interested Aboriginal groups in developing the management objectives and monitoring programs for moose populations in the Lower Athabasca region. (Effects on Wildlife and Their Habitat)

Recommendation 52 - The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address some of the likely significant adverse effects of the Project, including effects on some migratory birds. (Effects on Wildlife and Their Habitat)

Recommendation 53 - The Panel recommends that the Governments of Canada and Alberta, in collaboration with interested Aboriginal groups and stakeholders, initiate a joint effort to determine if there has been a decline of waterfowl in the oil sands region and/or if migration routes have changed. If results suggest that there has been a decline or if routes have changed, the Panel recommends that the Governments of Canada and Alberta work together to determine the cause(s). (Effects on Wildlife and Their Habitat)

Recommendation 54 - The Panel recommends that the Government of Canada conduct studies to estimate abundance, density and carrying capacity of the oil sands region for migratory birds. (Effects on Wildlife and Their Habitat)

Recommendation 55 - When considering the need for conservation offsets, the Panel recommends the Governments of Canada and Alberta also consider the need to preserve the suite of species and ecosystems in the region and to maintain local and regional biodiversity. The Governments of Canada and Alberta should also consider the need to preserve unique environments and species such as those found in the lenticular fen. (Effects on Biodiversity)

Recommendation 56 - The Panel recommends that ESRD ensure that, in addition to the use of commercially available vegetation, Shell be required to plant a greater initial number of species and ensure measures such as seed collection, direct seeding, and planting stock from cuttings or seed, instead of relying heavily on the natural ingress of species to return biodiversity to reclaimed landscapes. (Effects on Biodiversity)

Recommendation 57 - The Panel recommends to ESRD that Shell be required to develop a biodiversity monitoring program and report progress and results of the program as part of its closure and reclamation annual report. In order to protect biodiversity, the Panel expects Shell to modify mitigation strategies based on the findings of the program. (Effects on Biodiversity)

Recommendation 58 - The Panel recommends that the Government of Alberta work toward timely completion of the *LARP* biodiversity management framework, including a reporting and monitoring structure to ensure that relevant parties such as Shell are in compliance. (Effects on Biodiversity)

Recommendation 59 - The Panel recommends to ESRD that Shell be required to apply direct placement techniques when ever an opportunity exists in order to help the process of regeneration and to minimize double handling of material. (Reclamation)

Recommendation 60 - The Panel recommends that Alberta Health and Wellness and Health Canada complete a regional baseline health study focused on First Nations, Métis and other Aboriginal groups that considers all relevant health factors including environmental exposures and potential exposure pathways such as water, air, and consumption of traditional foods. The Panel notes that a similar recommendation was made in the Joint Panel report approving the Jackpine Mine Phase 1 project in early 2004 (EUB Decision 2004-009) (Human Health, Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 61 - The Panel recommends that the Governments of Canada and Alberta, in collaboration with Aboriginal groups, monitor the occurrence and rate of aerial deposition of contaminants on traditional plants to determine the extent of regional effects on plant quality. (Human Health)

Recommendation 62 - The Panel recommends that the Governments of Canada and Alberta work with the CCME to develop specific water quality objectives for naphthenic acids. (Human Health)

Recommendation 63 - The Panel recommends that the Alberta Government provide a timeline for land release to the RMWB. (Social and Economic Effects)

Recommendation 64 - The Panel recommends to ESRD and RMWB that they devise a process to make each other aware of when either entity receives a request for camp authorization. (Social and Economic Effects)

Recommendation 65 - The Panel recommends that the Government of Alberta develop and implement a TLU management framework for the Lower Athabasca region as a component of the *LARP*. The Panel recommends that the Government of Alberta develop this framework in conjunction with the Government of Canada, other stakeholders and all of the Aboriginal peoples affected by industrial development that practice their rights in the oil sands region. The Panel recommends that this framework be maintained and adapted over time to ensure the protection of Aboriginal land use and treaty rights in the oil sands region. (Effects on Aboriginal Traditional Land Use, Rights, and Culture, Regional Effects)

Recommendation 66 - The Panel recommends to the Governments of Alberta and Canada thatbefore other provincial and federal approvals are issued, Alberta and Canada consider the adequacy of the Crown's consultation with each of the Aboriginal groups in light of the issues identified in this report to determine whether additional consultation is necessary to address these issues, including likely significant adverse Project and cumulative effects to a number of resources important to Aboriginal people and likely significant adverse cumulative effects to

Aboriginal traditional land use, rights and culture. (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 67 - The Panel recommends that EC in collaboration with ESRD conduct joint research, in collaboration with the interested Aboriginal groups, and report on the causes of the perceived drying of the Athabasca oil sands region and the PAD and that Aboriginal concerns on this issue be considered in any Phase 2 water allocations. (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 68 - The Panel recommends that the Governments of Alberta and Canada consider ACFN's unresolved concerns about the diversion of the Muskeg River and the need for additional consultation, mitigation, or accommodation before other provincial and federal approvals are issued (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 69 - The Panel recommends that the Government of Alberta, in conjunction with the Government of Canada, provide greater opportunities for involvement of First Nation and Métis groups in regional planning and in the stewardship of the traditional resources, in order to mitigate the adverse effects on the traditional land use and culture of these groups. (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 70 - The Panel recommends that the Government of Alberta consider developing a Métis consultation policy that outlines expectations and provides guidance with respect to Métis consultation (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 71 - The Panel recommends that the Government of Alberta require Shell to offer to enter into access agreement discussions with MNA and the Métis Locals to provide for Métis access to areas of TLU. (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 72 - The Panel recommends that the Governments of Canada and Alberta ensure that First Nation and Métis groups in the Lower Athabasca Region are effectively engaged in the new joint provincial-federal monitoring initiatives. (Effects on Aboriginal Traditional Land Use, Rights, and Culture)

Recommendation 73 - The Panel recommends that the Governments of Canada and Alberta incorporate both the biodiversity management framework and a comprehensive assessment of Aboriginal TLU into the development of the regional landscape management plan. The Panel believes it is critical that these are incorporated even if the completion of the integrated landscape management plan is delayed. (Regional Effects)

Recommendation 74 - The Panel recommends that Governments of Canada and Alberta ensure that Aboriginal groups are involved in reclamation planning to help better design plans to include Aboriginal TLU requirements such as valued traditional species and culturally important landscapes. (Regional Effects)

Recommendation 75 - The Panel recommends to the Government of Alberta that the *LARP* biodiversity management framework take into consideration that timely and progressive reclamation may not adequately address the loss of biodiversity. (Regional Effects)

Recommendation 76 -The Panel recommends that before other provincial and federal approvals are issued, the Governments of Canada and Alberta cooperatively consider the need for conservation offsets to address the significant adverse project effects to wetlands, wetland-reliant species at risk, migratory birds that are wetland-reliant or species at risk, and biodiversity and the significant adverse cumulative effects to wetlands, traditional plant potential areas, old-growth forests, wetland-reliant species at risk and migratory birds, old-growth forest reliant species at risk and migratory birds, biodiversity and Aboriginal traditional use. (Regional Effects)

Recommendation 77 -The Panel recommends that until the *LARP* biodiversity management framework is in place, the *TEMF* be used to provide appropriate guidelines and thresholds for management of cumulative effects in the oil sands region. (Regional Effects)

Recommendation 78 -The Panel recommends to the Government of Alberta that the *LARP* biodiversity management framework take into account the loss of wetlands and provide thresholds to ensure enough wetlands, including peatlands, are maintained in the lower Athabasca region to maintain biodiversity and protect species of cultural importance to Aboriginal people. (Regional Effects)

Recommendation 79 -The Panel recommends that the Government of Alberta and EC work cooperatively to:

- meet the goals outlined in recovery strategies for species at risk, including the protection of critical habitat, meeting population recovery objectives, and any other management initiatives put in place for listed species;
- complete recovery strategies as soon as possible for wood bison, Canada warbler, olive-sided flycatcher, common nighthawk, and rusty blackbird;
- complete management plans for species of special concern; and,
- develop action plans to provide the mechanisms required to protect identified critical habitat, as well as other actions required to protect listed species (e.g., Range Plans for caribou in the Richardson Range). (Regional Effects)

Recommendation 80 -The Panel recommends that the government of Alberta consider establishing ambient environmental limits and triggers for other air quality compounds in the future as a part of *LARP*, in addition to SO_2 and NO_2 (Regional Effects).

Recommendation 81 -The Panel recommends an EBF be set as part of *Phase 2 of the Lower Athabasca Water Management Framework*, taking into account stakeholder needs. Recognizing the important implications of this framework, the Panel urges the Governments of Alberta and Canada to conclude the development process and implement this framework expeditiously. (Regional Effects)

Recommendation 82 -The Panel recommends that the Government of Alberta complete and implement the surface water quality management and groundwater management frameworks as quickly as possible to ensure that the quality of water in the region is within the regulatory aquatic life guideline values. The Panel notes that the *LARP* indicates that the information will be reported on and recommends that this information be provided to the public. (Regional Effects)

Recommendation 83 - The Panel recommends that a regional study be conducted by DFO in cooperation with other government agencies and stakeholders, including Aboriginal groups, to determine the cumulative effects to fish health, abundance and habitat in the oil sands region. This study should take into account the effects of water quantity and quality on fish health and habitat, as well as changes to rivers and streams and the use of compensation lakes to replace fish habitat. The study should determine how long it takes for fish to establish in the compensation lakes and how long before the fish can be safely consumed by humans and wildlife. Fish biodiversity should also be assessed to determine changes to biodiversity that occur as a result of removing or changing rivers and streams and replacing that habitat with lakes. (Regional Effects)

Recommendation 84 - The Panel recommends that the Governments of Canada and Alberta obtain further information from RMWB about the lack of an integrated process to bring the federal, provincial and municipal governments together with industry to solve problems, including land release, and to consider how such an integrated process could be developed. (Regional Effects)

Recommendation 85 - The Panel urges the Government of Alberta to address RMWB's need for developable land on a priority basis. In addition, the Panel recommends the Government of Alberta implement a coherent and functioning land release policy as recommended by RMWB. (Regional Effects)

Recommendation 86 - The Panel recommends that the Government of Alberta consider the matter of coordination problems between the transportation authority and the land release authority and to determine means to provide greater coordination between and among its ministries. (Regional Effects)

Recommendation 87 - The Panel recommends that the Government of Alberta determine what is needed to proceed with the bypass proposal. (Regional Effects)

Recommendation 88 - The Panel recommends that the Government of Alberta ensure that the RMWB concerns are addressed in the camp approval process, to advise the RMWB of approvals issued, and to address the RMWB's concerns respecting compliance with the terms of such approvals. (Regional Effects)

APPENDIX 7 RECOMMENDATIONS PROVIDED BY THE GOVERNMENT OF CANADA IN ITS OCTOBER 1, 2012, SUBMISSION TO THE PANEL

1) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy that cumulative effects on downstream fish habitats be assessed, including but not limited to, middle reaches of the Muskeg River, Shell Canada Energy's Jackpine Mine and Imperial Oil's Kearl Mine fish habitat offsets, Kearl Lake, the lower reaches of the Muskeg River, and the Athabasca River including the Athabasca River Delta. DFO believes that it is possible for an individual oil sands operator to undertake this assessment. An alternative to this would be to conduct this assessment in cooperation with other oil sands operators and regional stakeholders.

2) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to finalize and implement a detailed plan that will provide at minimum, a 2:1 ratio of fish habitat gains versus impacts based on Habitat Units. In addition, the plan should consider Fish Management Objectives, terrestrial ecosystem and wildlife values, as well as incorporate components of cultural significance.

3) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to continue to support the collection of data related to the traditional use of lands and resources, as well as establish a protocol for evaluating the traditional use on future reclaimed landscapes in the Muskeg River watershed.

4) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to develop and implement a monitoring program, to the satisfaction of DFO, aimed at validating Habitat Suitability Index models and verifying predictions related to quality and quantity of fish habitat that will be directly and indirectly impacted by the Project. The monitoring program should include evaluation of the pre-disturbance habitat, the proposed fish habitat offsets, the habitats altered by changes in flow, changes in productivity resulting from upstream activities, and verification of the modelling associated with the evaluation of productive capacity of fish habitat.

5) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to develop and implement an auditing and reporting system, to the satisfaction of DFO, that will verify compliance with conditions of any *Fisheries Act* authorization, and evaluate the effectiveness of all associated mitigation measures and monitoring programs, as well as the predictive capability of the habitat models.

6) Uncertainty remains as to the likelihood of success of the aquatic closure landscape End Pit Lakes and how they will function in the aquatic ecosystem. Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to design closure landscapes so that they may be integrated into the natural environment. DFO will work with Shell Canada Energy during the design phase, and throughout the Project life, on the design and monitoring of aquatic habitats on the reclaimed landscape.

7) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to design and operate its facilities in a way that complies with the current and any future requirements of the joint federal-provincial Water Management Framework.

8) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to continue its support for the development of, and participate in the implementation of, a monitoring program that focuses on cumulative effects assessment of water withdrawals.

9) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to continue providing technical and financial support to ensure the ongoing collection of data relating to the traditional use of lands and resources of the Lower Athabasca River.

10) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation that Shell Canada Energy, in collaboration with Aboriginal groups, Industry, and government, meaningfully participate in the development and implementation of initiatives established to detect, monitor and adaptively manage cumulative effects on fish habitat in the Lower Athabasca River watershed. Should the monitoring indicate that there are additional adverse effects on fish habitat resources in the Lower Athabasca River watershed not already considered, Shell Canada Energy shall mitigate or, if necessary, offset those impacts.

11) Fisheries and Oceans Canada recommends that the Joint Review Panel's report include a recommendation to Shell Canada Energy to develop and implement a communications strategy that ensures the transparent communication of monitoring results, water use, constructed fish habitat successes, and accidents and malfunctions related to aspects of the Project that may affect fish or fish habitat. In consultation with appropriate government representatives, this communications strategy should also acknowledge and address the concerns of contamination, including from methyl mercury, in local fish stocks.

12) EC requests the Panel recommend that Shell Canada:
   a) Identify and implement measures that avoid direct loss of species at risk and migratory bird habitat;
   b) Identify and implement measures that avoid the effects of drawdown on the lenticular patterned fen and Yellow Rail habitat during Project construction and operations;
   c) Identify and implement mitigation measures that minimize disturbance (e.g., noise) effects on residual habitat during Project construction and operations;
   d) Develop and implement a follow-up program that requires:
      i) collecting additional detailed baseline data on the distribution and abundance of species at risk and migratory birds in the LSA and drawdown zone prior to any additional site disturbance, and monitor changes in local populations and use of residual habitats during the JPME Project construction and operations to validate predictions of the EA;
      ii) monitoring the condition of the lenticular fen and use by species at risk and migratory birds (including, but not limited to, Yellow Rail) during Project construction and operations and implement measures, as necessary, to maintain the condition and function of the fen;
      iii) monitoring the effectiveness of any measures used to mitigate residual and direct and indirect habitat loss for species at risk and migratory birds, including the function of any conservation allowances that are considered;
      iv) monitoring the use of reclaimed habitats by species at risk and migratory birds to evaluate success;
   e) Consider, in the event that proposed measures cannot mitigate direct and indirect habitat loss for species at risk and migratory birds, the use of conservation allowances. Shell Canada should refer to the design criteria outlined in EC's Operational Framework for Use of Conservation Allowances (Environment Canada 2012);
   f) Identify the habitat requirements of affected species at risk and migratory birds to inform reclamation planning;
   g) Incorporate species at risk and migratory bird habitat requirements into reclamation plans;
   h) Adjust reclamation techniques and prescriptions, as necessary, to maximize use of reclaimed habitats by affected species at risk and migratory birds; and
   i) Experiment with peatland reclamation and report on successes and challenges for the benefit of peatland reclamation in the oil sands region.

13) EC requests the Panel recommend that Shell Canada:
   a) Avoid habitat clearing during the migratory bird nesting window (April 1 to August 31);
   b) Remove all vegetation (including peat) from tailings ponds prior to operations to minimize attraction of birds;

c) Contain and remove residual surface oil from tailing ponds on an ongoing operational basis to minimize potential contact with birds;
d) Implement best available bird deterrent technology at tailings and implement bird deterrent technology in a timely manner to coincide with the beginning of bird migration, including that of Whooping Cranes;
e) Participate in regional bird deterrent research and monitoring programs and incorporate findings in a timely manner into Shell Canada's deterrent program;
f) Monitor and report on use of tailings ponds by birds, including all mortalities, and general movement of birds (including species at risk) in the mine area;
g) Implement measures to prevent attraction to and collisions of birds with Project infrastructure (e.g., transmission lines, communication towers) and vehicles, including the use of line markers and bird-friendly lighting;
h) Relocate species at risk with low mobility (e.g., amphibians) prior to clearing, where feasible;
i) Implement measures that avoid attraction of wildlife, including predators, to facilities and other Project infrastructure;
j) Design the Kearl Lake levee to avoid impacts to aquatic habitats used by migratory birds;
k) Monitor use of Kearl Lake by migratory birds prior to and following construction of the Kearl Lake levee; and
l) Identify and implement additional mitigation measures, as required based on monitoring, to ensure habitat quality on Kearl Lake for migratory birds does not decline as a result of the Kearl Lake levee and any adjacent disturbances.

14) EC requests the Panel recommend that Shell Canada:
a) Minimize their contribution to cumulative effects by implementing the full suite of mitigation measures proposed by EC in recommendations 1 and 2; and,
b) Support regional biodiversity monitoring initiatives such as that being implemented under the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.

15) Given the cumulative modelling uncertainties and the 100-year timelines of oil sands mine projects, EC advises that an adaptive management regime be implemented by the Proponent to ensure the environmental performance of the Project does not impair aquatic ecological integrity. EC requests the Panel recommend that Shell Canada:
a) Re-calibrate their aquatic models every five years with best available information and re-run simulations that estimate predicted impacts to the aquatic environment and make the results publically available.
b) Evaluate the efficacy of the existing chronic effects benchmark (CEB) values by testing mixtures of these same chemicals at the CEB concentrations, using a range of representative organisms, including the fathead minnow early life-stage test since it is a locally resident species.

   c) Annually release publicly all on-site water and air quality monitoring data collected under Alberta Environment and Sustainable Resource Development (AESRD) permit requirements as a contribution to the contaminant source – pathway fate and effects monitoring conducted under Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.
   d) Work cooperatively with Aboriginal Groups, AESRD and EC to finalise Muskeg River Interim Management Framework for Water Quality and Quantity to protect local aquatic health by establishing local water quality objectives that would trigger Proponent EIS water quality and aquatic health mitigation measures.

16) In order for the Panel to fully assess the potential impacts of GHG emissions from the JPME Project, EC requests the Panel recommend that Shell Canada provide details on the measures in the JPME Project that will reduce GHG emissions associated with the operation of the facility and will help Canada meet its GHG reduction targets.

17) In order for the Panel to assess impacts from the JPME mine fleet emissions, EC requests the Panel recommend that Shell Canada report on best management practices for mine fleet equipment, including the use of new Tier 4 technologies, to enhance maintenance and minimize idling in order to minimize emissions of NOx, PM, GHGs and other contaminants. These practices could include, but not be limited to:
   a) developing idling limits,
   b) training drivers to minimize idling,
   c) mode of operation analysis, and
   d) combined use of individual vehicle fuel usage indicators, vehicle emission testing, and electronic diagnosis techniques to trigger maintenance.

18) EC requests the Panel recommend that Shell Canada:
   a) Implement an ongoing monitoring program that can be used to determine the magnitude and speciation of tailings pond and mine face GHG and air emissions (particularly methane, benzene, and other VOCs) and provide this information to EC.
   b) Based on results from the monitoring program, evaluate and where feasible, implement changes to reduce fugitive GHG and air emissions from tailings ponds and mine faces.
   c) Annually release on-site air quality monitoring data to meet their Alberta Environment and Sustainable Resource Development (AESRD) permit requirements and to inform the contaminant source – pathway fate and effects monitoring conducted under Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.

19) EC requests the Panel recommend that Shell Canada:
   a) Develop comprehensive emergency preparedness plans that identify, describe and evaluate the potential impacts of all reasonably foreseeable project-related accidents

and malfunctions involving the actual or potential release of chemicals or hazardous materials;

b) Develop comprehensive emergency response plans that identify specific and detailed procedures to ensure a prompt response, regulator notification and cleanup in the event of a chemical or hazardous substance spill or threat of release;

c) Provide the plans identified in (a) and (b) prior to construction, for review by EC and upon request of other interested stakeholders and Aboriginal groups.

20) NRCan recommends to the JRP that Shell Canada:

a) Confirm simulated results using field data available through the monitoring program for Phase I of the Jackpine Mine Project.

b) Ensure that once the operations of the expansion project have started, the proponent updates regularly the flow and transport models, e.g., at suitable intervals based on the incoming information from the groundwater quantity and quality monitoring program. This would provide information to verify the predictions of the current numerical models and to increase confidence in the results of future updated models.

21) NRCan recommends to the JRP that Shell Canada:

a) Provide evidence or justification that the factors of safety (FOS) from the slope stability analyses provided are the lowest that the Proponent can derive and that the proposed mining and waste disposal plans (e.g., height, setback, areal coverage) are feasible. This is preferably done through geotechnical reports of conceptual or feasibility level slope stability design of the major mine elements including open pits, OBDA, south ETDA, and north ETDA.

22) NRCan recommends to the JRP that Shell Canada:

a) Provide a description of what will be done with the process water from the centrifugation of MFT at the end of mine life (NRCan estimates 16 Mm^3 of process water will be produced from 2050 to 2054) as this water will not be recycled back to extraction at JPME and will be saline and toxic.

b) Provide a description of how they plan to deal with off-specification nonsegregation tailings (e.g., dredge and re-retreat or remediate in place).

23) NRCan recommends to the JRP that Shell Canada:

a) Provide a different rationale for not using 100 per cent of the solvent in the ponds in modelling VOC emissions, or a revised annual average emission rates for VOCs.

b) Provide an explanation for the reduction in estimated VOC emissions from the tailings ponds for the MRDA 2011 plan as compared to the original 2007 plan.

APPENDIX 8 LIST OF RECOMMENDATIONS FROM THE ABORIGINAL GROUPS

The recommendations listed in this appendix were made to the Panel by the Aboriginal groups that participated in the hearing. Not all of the recommendations listed in this appendix have been adopted by the Panel; they are summarized here for completeness and to assist the reader in understanding the submissions of the Aboriginal groups. The Panel's recommendations are listed in appendix 4.

A. ACFN RECOMMENDATIONS

1) ACFN opposes approval of the Project and respectfully submits that the Project, will result in significant adverse environmental effects and unacceptable adverse impacts on ACFN's Treaty 8 Rights, is not in the public interest, and should not be approved.

2) Should the Panel find over ACFN's objections that the Project is in the public interest and that it will not result in significant adverse environmental effects, ACFN requests that any approval or recommendation that the Project proceed be made conditional upon completion or implementation of all the following matters prior to the issuance of any further decisions on oil sands projects in ACFN's Traditional Lands by the AER or by a subsequent Joint Review Panel:

    a) ACFN co-management of the Richardson Backcountry;

    b) Completion and implementation of a Traditional Land and Resource Use Management Plan, prior to any approvals being issued for this Project or other industrial development;

    c) Adherence to the thresholds and limits identified in the Traditional Lands and Resource Use Management Plan in subsequent regulatory processes conducted by and decisions of the AER or a Joint Review Panel;

    d) Use of the Traditional Land and Resource Use Management Plan to select conservation areas;

    e) A five year 'freeze' on new development In the certain areas of the oil sands region, until two years of data are available and have been analysed, per the timelines set out in the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring;

    f) Adoption and implementation of ACFN's recommendations, including the maintenance of an Aboriginal Base Flow, as set out in the enclosed "Review of the Phase 2 Framework Committee Recommendations Synthesis Report"; including full protection of the Athabasca River for the continued exercise of Treaty Rights;

    g) Regulatory reform whereby:

        i) First Nations in the region play a role in decision-making on proposed industrial development projects;

  - ii) Regulatory and legislative mechanisms relating to land and water use have a rights-based focus and are consistent with the protection of section 35 rights;
  - iii) Regional planning regulations and related legislation acknowledge that the ability of aboriginal peoples to exercise traditional uses of the land may be linked to specific lands and territories and the resources thereon, which require conservation to maintain the ability of aboriginal peoples to exercise traditional uses; and
  - iv) Project-specific terms of reference for environmental assessments must expressly require information gathering and consideration of potential direct and cumulative impacts on the exercise of section 35 rights.

h) Assessment of the effects of the Project and the Planned Development Case on the Delta and implementation of an independent and scientifically rigorous monitoring program for the Delta, in consultation with affected First Nations, to address this issue;

i) Independent and scientifically rigorous assessment and verification of the accuracy of models used to predict the functioning of end pit lakes;

j) Provision of independent and scientifically rigorous evidence to support assertions of effective reclamation techniques for replicating the natural eco-sites and wetlands of the region;

k) Issuance by the federal government of an emergency order under the federal Species at Risk Act protecting the. full ranges of woodland caribou in north-eastern Alberta from further industrial development, and/or the identification ·and protection of the full ranges of woodland caribou in northeastern Alberta as critical habitat through other provisions of the Species at Risk Act;

l) Immediate protection for the Ronald Lake Bison herd from non-First Nations hunting, and of the herd's habitat throughout their range, from disturbance;

m) Identification of critical habitat for wildlife and plant species at risk in the Traditional Lands by independent scientists and protection by the federal and/or provincial governments of such critical habitat from further development;

n) Implementation, through consultation with ACFN, of independent and scientifically rigorous regional monitoring programs that: test EIA predictions; monitor the quality and quantity of water in the Athabasca River. Including between Fort McMurray and Old Fort; and monitor the cumulative impacts of regional development upon human health;

o) The establishment of an independent panel to evaluate consultation in the oil sands region;

p) No further development until the frameworks called for under LARP are complete; and

q) Accommodation measures must be established in relation to adverse impacts and infringements of s. 35 rights.

3) ACFN also requests that the following Project-specific requirements be attached to any decision of the Panel to allow the Project over ACFN's objections:

a) That permitting, construction and operation be delayed for a minimum of five years, when two year of data is available and has been analysed. per the timelines set out in the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring and until the frameworks called for under LARP are complete;

b) That permits and authorizations, construction and operations be deferred until such time as a Traditional Land and Resource Use Plan has been completed, and binding thresholds and measures set that will allow regulators to condition permits and authorizations in a manner which protects and prioritizes ACFN Treaty Rights;

c) The establishment (through consultation with ACFN and reference to a Traditional Lands and Resource Use Management Plan) and enforcement of firm and legally-binding emissions limits for air and water pollution annually and over the lifetime of the Project;

d) The establishment and enforcement of a science and traditional knowledge based groundwater monitoring program, through consultation with ACFN; with the results measured against the thresholds or limits established in a Traditional Lands and Resource Use Management Plan;

e) That any authorization issued pursuant to the Water Act give priority to ACFN's constitutionally protected right to sufficient quantity of navigable water In the Lower Athabasca River, in other words withdrawal must cease when flows fall below the Aboriginal Base Flow;

f) That permits and authorizations be deferred until such time as the afore mentioned data is available to regulators, so that permits and authorizations can be based upon sound science and reflect the precautionary principle;

g) That the ore beneath the Muskeg River and its riparian zone be sterilized, and the Muskeg River be left to flow in its natural state, and that full protection of this river be put in place;

h) That prior to the commencement of construction, the Applicant must post a reclamation bond of a size and character that will ensure that Project lands will be progressively and effectively reclaimed to a standard, and in a timeframe, consistent with the exercise of ACFN's Treaty Rights;

i) That adequate and effective wildlife corridors through or around the Project be established over the life of the Project, reestablishment of appropriate wildlife habitat in the closure landscape, and reestablishment of key wildlife species to target densities on the site;

j) That prior to the commencement of construction, the Applicant must: obtain an insurance review by an independent consultant to determine the appropriate level of environmental and third-party liability coverage, to address inter alia, unanticipated levels or types of Project-specific environmental effects; obtain said coverage; and submit proof of same to the Board;

k) The design and implementation of Project-specific wildlife and fish monitoring programs, through consultation with ACFN, with the results measured against the thresholds or limits established in a Traditional Lands and Resource Use Management Plan;

l) ACFN be included in lease site monitoring programs, fully supported by Shell;

m) The monitoring of stack and fugitive emissions and air quality, vegetation and soils around the Project with the results measured against the thresholds or limits established in a Treaty Rights Assessment and Traditional Lands and Resource Use Plan;

n) That Shell provide funding for culture programs related to land-based knowledge be provided to mitigate the losses associated with the reduced access to Traditional Lands;

o) The creation and implementation of more effective and continuous environmental, human, and community health monitoring systems;

p) Funding for and the conduct of community-based comprehensive baseline country food harvesting and consumption study including dedicated study of risk perception and its impacts on country food harvesting among ACFN members;

q) The provision of support and funding for programs and initiatives designed to mitigate the negative community and regional-level socioeconomic effects;

r) The funding for and completion of a socio-cultural assessment as proposed to Shell by ACFN; and

s) The creation of a socio-economic monitoring program to assess the effectiveness of socio-economic effect mitigation measures implemented by any of Shell, the government of Canada and the government of Alberta.

B. MÉTIS NATION OF ALBERTA RECOMMENDATIONS

1) A finding that:

  a) The evidence shows that there is a credible assertion that the Aboriginal Rights of the Métis in the area will be impacted by this Application;

  b) That the Government of Alberta has not engaged in any consultation with any Métis people with respect to this Application; and

   c) Shell has not fulfilled the Terms of Reference of the Government of Alberta or the Joint Review Panel and therefore cannot be said to have relieved the Crown of their obligation to consult and/or accommodate the impacts to the Aboriginal rights asserted.

2) A denial of the application on the basis that the impact on the Aboriginal Rights of the Métis people in the area has not been addressed in the Application.

C. NSFMFM AND CLEARWATER BAND RECOMMENDATIONS

1) Non-Status First Nation and Clearwater River Band are asking this Panel to recommend that the Application not be approved until they are adequately consulted on their rights with respect to the Project and until their concerns regarding how the Project will impact them are fully addressed. Therefore, the Non-Status First Nation and the Clearwater River Band would like to make the following requests that:

   a) The Joint Review Panel recommend that the Crown recognize the Section 35 rights of the Non-Status First Nation and the Clearwater River Band and the potential infringement on those rights by the Project should it be approved.

   b) The Joint Review Panel recommend that the Project is not in the public interest and cannot be authorized unless and until the Crown has fully discharged its duties to consult and accommodate the Non-Status First Nation and the Clearwater River Band with respect to potential effects on its Treaty and Aboriginal Rights.

   c) The Joint Review Panel recommends that the consultation process owed to the Non-Status First Nation and the Clearwater River Band include, but not be limited to:

      i) Consideration of the potential impacts of the Project on their Section 35 rights,
      ii) Consultation prior to finalizing any resources management frameworks or plans with regards to oil sands activities or to environmental management in the Project area or the greater Athabasca region in general.
      iii) The provision of resources to the Non-Status First Nation and the Clearwater River Band to document the nature and scope of their Aboriginal and Treaty Rights, including traditional land use studies, Traditional Ecological Knowledge studies, and cultural studies.
      iv) Provision of capacity funding to both groups in order to undertake studies that identify any potential additional adverse impacts that may be caused by the Project, including the cumulative impacts which have not yet been identified.
      v) Capacity funding to partner with local organizations, governments and industry to address those impacts.

2) The Non-Status First Nation and Clearwater River Band request that the Joint Review Panel recommends that no approvals or authorizations be issued in relation to this Project until:

   a) Shell engage in a cultural sensitivity workshop with the Non-Status First Nation and the Clearwater River Band;

   b) The Non-Status First Nation & Clearwater River Band are satisfied that any sites of historical or cultural significance to the groups have been adequately identified and protected;

   c) Members of those groups be permitted to harvest diamond-willow fungus that occurs in the Project area before any activities occur there that may disturb or harm that resource;

   d) Any other resources of cultural environmental health and social importance to the Non-Status First Nation & Clearwater River Band be adequately protected;

   e) Both groups receive compensation for any losses or harm to those resources that might occur.

3) The Non-Status First Nation and Clearwater River Band recommends that the conditions requested by the Oil Sands Environmental Coalition regarding the environmental protections and measures that they have set out are met.

4) The Non-Status First Nation and Clearwater River Band request that:

   a) Studies on freshwater clams in the Athabasca River are undertaken;

   b) Studies evaluate the critical water temperature for the fish habitat during different seasons;

   c) The outcrops along the riverbanks on Shell's leases be identified, and that the information be provided to CEMA and included in its EIAs;

   d) The wildlife corridors being maintained, not only to sustain the wildlife but also sustain the natural resources that are there.

D. FORT MCMURRAY FIRST NATION #448 RECOMMENDATIONS

1) The Application should be denied at this time due to the concerns outlined by FMMFN #448

2) If the Panel approves the Project FMMFN#448 requests that:

   a) In order to prevent significant adverse environmental effects from occurring to terrestrial resources and the use of land by Aboriginal peoples for traditional purposes and Treaty Rights and given the pace of development in the oil sands region, FMMFN#448 would ask for a condition to delay the project. FMMFN#448 stated that, if the Joint Review Panel approves the project, it should recommend a condition that the Project be delayed for a period of 10 years.

   b) A condition be put on any approval that Shell consults with Fort McMurray First Nation and complete a traditional use study with respect to impacts from the

Project on Fort McMurray's rights and file the same within six months prior to construction commencing.

E. FORT MCKAY RECOMMENDATIONS IN RELATION TO CUMULATIVE EFFECTS AND CONSULTATION

1) In order to improve management of cumulative effects to avoid or minimize adverse effects, Fort McKay requests that the Panel recommend to Alberta and Canada:

   a) For traditional land use:

      i) The establishment of protected areas specifically to traditional land use opportunities that are: in reasonable proximity to the community of Fort McKay; within its culturally significant ecosystems including those surrounding its reserves at Moose Lake (I.R. 174a and 174); and that contain sufficient undisturbed resources to mitigate the declines in wildlife and other terrestrial resources;
      ii) Implementation of access management plan that includes 1) measures to reduce new linear disturbance, decrease public access to linear disturbances, and accelerates reclamation of them; and 2) protection for Fort McKay's traditional trails and access to its reserves, traplines and hunting areas; and
      iii) A commitment and process by Alberta and Canada to consult and accommodate Fort McKay with respect to the impacts of regional development on its aboriginal and treaty rights.

   b) For air quality and odours:

      i) Enforceable limits for odours and a regional monitoring system that will include monitoring odours in Fort McKay; and
      ii) Reduction of existing emissions through standards and requirements for use of Best Available Technically and Economically achievable emission control technology.

   c) For wildlife:

      i) Annual wildlife population surveys;
      ii) Immediate reduction of moose harvest levels allowed for non-Aboriginal hunters throughout the entire oil sands region until current moose populations are determined;
      iii) Establishment of conservation areas within Fort McKay's traditional territory,
      iv) Including protected areas, that are sufficient to preserve wildlife habitat and populations;
      v) Acceleration of reclamation of disturbed areas in the oil sands area. Additional development approval based upon reclamation performance; and
      vi) Wildlife monitoring that contributes to validation of habitat models and tests EIA predictions.

d) For surface water:

   i) The Phase 2 Water Management Plan for the Athabasca River be implemented with a minimum flow level required for the River.

2) Fort McKay also requests that the Panel recommend to Canada and Alberta that they appoint negotiators with the necessary mandate to negotiate accommodation measures with Fort McKay that include:

   a) Management of designated areas for the objective of maintaining traditional land use in reasonably close proximity to Fort McKay;

   b) Establishment of a protective buffer zone around Fort McKay's community and reserves (including 174a and 174b} on the west side of the Athabasca River;

   c) Consultation and coordination of land planning and development near the borders of Fort McKay's reserves and the community aimed at maintaining Fort McKay's land use on its reserves;

   d) Collaborative arrangements for the management of Fort McKay's traditional territory and its resources, including partnering in environmental monitoring and development of management strategies;

   e) Development of reclamation planning and criteria, in consultation with Fort McKay, that is aimed at restoring the land for traditional and other uses by the community, and that incorporates the knowledge held by Fort McKay members regarding the land prior to disturbance;

   f) Long-term economic arrangements to provide social and physical infrastructure and assist the community to prepare for and transition to a post oil sands economy; and

   g) Measures to promote, sustain and protect the health, security, well-being and economic development of the Community.

F. MCFN RECOMMENDATIONS RELATED TO CUMULATIVE EFFECTS AND CONSULTATION

The Mikisew request the Joint Review Panel make the following recommendations:

1) That Alberta and Canada jointly fund Mikisew to develop a Traditional Land and Resource Use Management Plan. Following the development of the plan that Alberta and Canada take the necessary steps to implement that Plan including adhering to the thresholds, limits and criteria identified in the Plan in subsequent regulatory processes conducted by and decisions of the AER or future joint review panels.

2) That monitoring be conducted by the federal government through a program overseen by a committee of independent experts and aboriginal representatives, including the Mikisew. This should include, at a minimum:

   a) that Alberta and Canada work with Mikisew to develop and fund a community-controlled health assessment of water and terrestrial resources including wildlife, and monitoring;

   b) implementation of an independent and scientifically rigorous monitoring program for the Delta in consultation with local First Nations to address the effects of current and reasonably foreseeable development on the Delta; and

   c) that Mikisew be meaningful included in the World Class Monitoring Program and that no further projects, after the Jackpine Mine Expansion and the Pierre River Mine Projects, be approved until the World Class Monitoring Program is operational and had at least 5 years to gather and assess data, including traditional knowledge.

3) That, through consultation with aboriginal peoples, Canada and Alberta take the necessary steps to regionalize the regulation of certain aspects of the oil sands such as reclamation, tailings reduction, and water use, giving equal weight to traditional knowledge and western science and having regard to the protection of Section 35 rights now and into the future.

4) That Alberta work with aboriginal peoples to jointly develop and finalize a wetland policy and reclamation standards that includes compensation for destroyed or altered wetlands particularly bogs and fens.

5) Specifically with respect to water bodies and waterways:

   a) That the Athabasca and Firebag Rivers be designated as a Heritage River;

   b) That Alberta and Canada establish a comprehensive and transparent monitoring program for water flows and water quality for the Lower Athabasca River Basin, including monitoring of tailings reclamation and tailings seepage, that is overseen by a government-funded committee of independent experts and aboriginal representatives, including Mikisew;

   c) That Alberta and Canada establish a precautionary aboriginal base flow for the Athabasca River at 1600 cubic metres per second, and a precautionary aboriginal extreme flow at a level of 400 cubic metres per second during the months that the river is used for travel;

   d) That Alberta and Canada immediately implement a precautionary base flow of the Athabasca River of 100 cubic metres per second. No withdrawals below this flow should be allowed;

   e) That governments work with aboriginal peoples to develop a process for altering water permits to existing mines so as to lower and cap the peak water withdrawal that will be needed by the oil sands industry from the lower Athabasca River;

   f) That Canada and Alberta include tributaries in their calculations of in stream flow needs as they finalize the Lower Athabasca Management Framework in Phase 2; and

   g) That Canada and Alberta adopt and implement all recommendations, including those listed above, as set out in the "Review of the Phase 2 Framework Committee Recommendations: Synthesis Report."

6) That Canada actively assume a stronger federal role in protecting fresh water in the oil sands through monitoring the release of toxic substances and the impacts of such substances on such fisheries and through a stronger enforcement presence.

7) That Canada and Alberta expand the testing parameters of drinking water at Fort Chipewyan to include PAHs and toxic metals using methodology capable of measuring at thresholds relevant to human health.

8) That Wood Buffalo National Park be included in any impact study in respect of oil sands activity.

9) That Alberta work with Mikisew and other Lower Athabasca First Nations to develop a Lower Athabasca Regional Plan ("LARP") that appropriately addresses First Nation concerns and that uses a rights-based approach to land-use planning including:

   a) That the results of a Mikisew-led traditional land and resource management plan be incorporated in the amended LARP.

   b) That Canada and Alberta acknowledge the First Nations exercise of Treaty rights as a priority land use in their traditional territories and cause that priority to be reflected in land use and resource development policies such as LARP and all Crown decision-making.

   c) The establishment of First Nation-specific land use conservation areas with viable corridors that are managed jointly with First Nations and Alberta.

10) That resources be provided to First Nations to conduct a regional cumulative effects assessment which includes comprehensive traditional land use and traditional ecological knowledge with the aim of developing a traditional resource use plan. That plan would be a key focus in other policies, such as LARP.

11) That Canada and Alberta utilize a terrestrial "No Net Loss" standard when considering disturbance approvals, giving equal weight to traditional knowledge and western science.

12) That Canada and/or Alberta establish predisturbance baseline information, including the range of natural variation for wildlife populations and the conditions required to support Mikisew's rights and culture before disturbance of any further industrial activity other than the Jackpine Mine Expansion and Pierre River Mine Projects.

13) That Canada and Alberta work with Mikisew to identify and protect key species affected by cumulative effects, such as bison, caribou and moose. In this regard, Canada must

revise the recovery plans for Wood Bison and Woodland Caribou identifying critical habitat which must be protected under the Species at Risk Act.

14) That Canada conduct with Mikisew a traditional food study to examine the impact of oil sands contaminants on traditional foods, such as: fish, moose, caribou, small game, bird eggs, and berries in the region. Special attention should be drawn to the location of traditional foods in relation to oil sands mine development.

15) That Alberta finalize the Oil Sands Mine Liabilities Management Program with input from Mikisew.

16) That Alberta and Canada conduct a comprehensive Baseline Health Study for Fort Chipewyan residents as recommended in the 2003 EUB Decision Report. In addition, a study of contaminant intake and body burden of members of Fort Chipewyan should be undertaken.

17) That Canada develop a comprehensive sustainable employment strategy with the Mikisew to address employment and training issues in the region.

18) That Canada and Alberta ensure the Mikisew has adequate capacity for meaningful consultation on all resource development activities that may impact their traditional lands.

19) That Canada and Alberta resource additional First Nations-directed analysis related to health, diet, practice of treaty and aboriginal rights and avoidance patterns related to contaminants.

APPENDIX 9 MAPS AND FIGURES

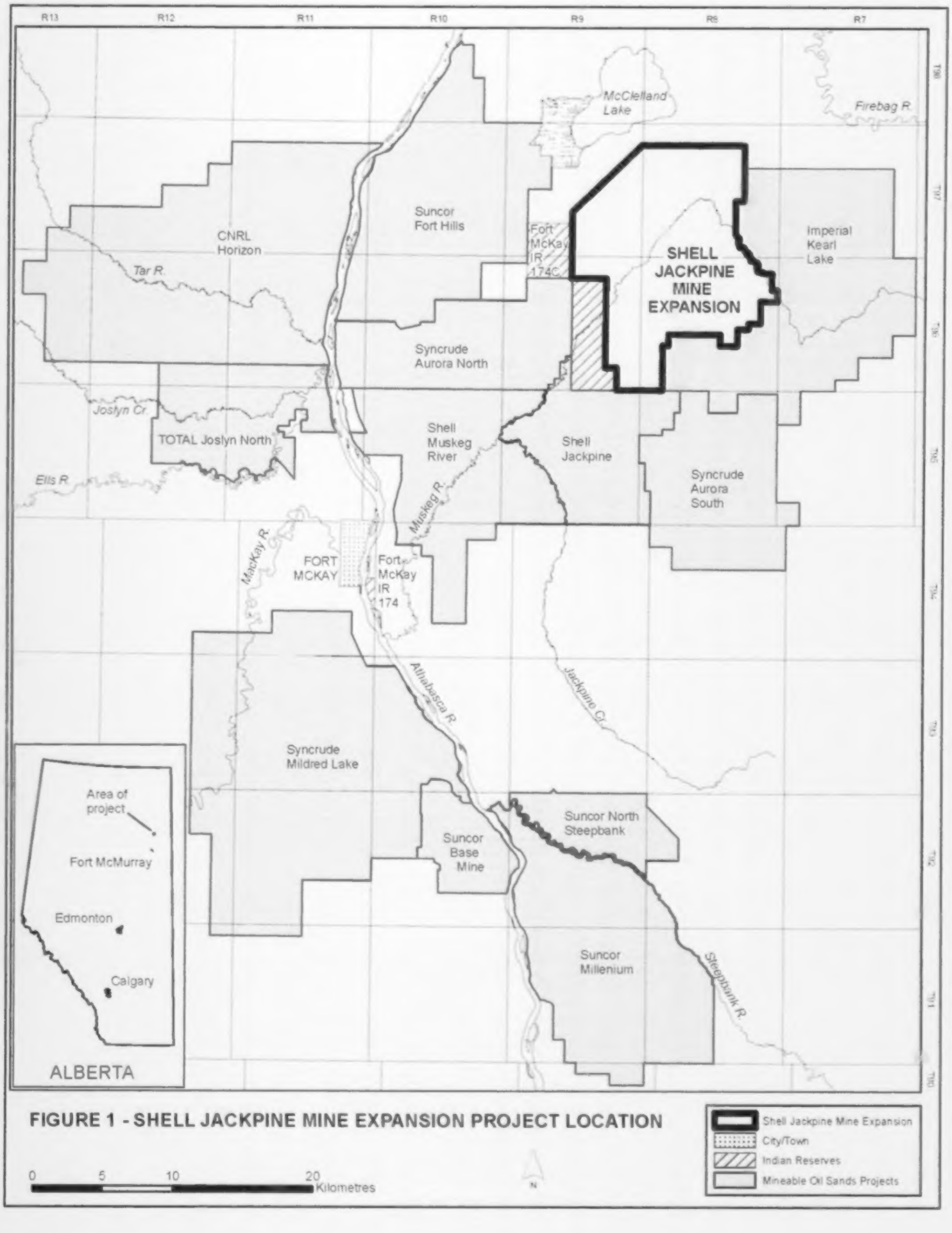
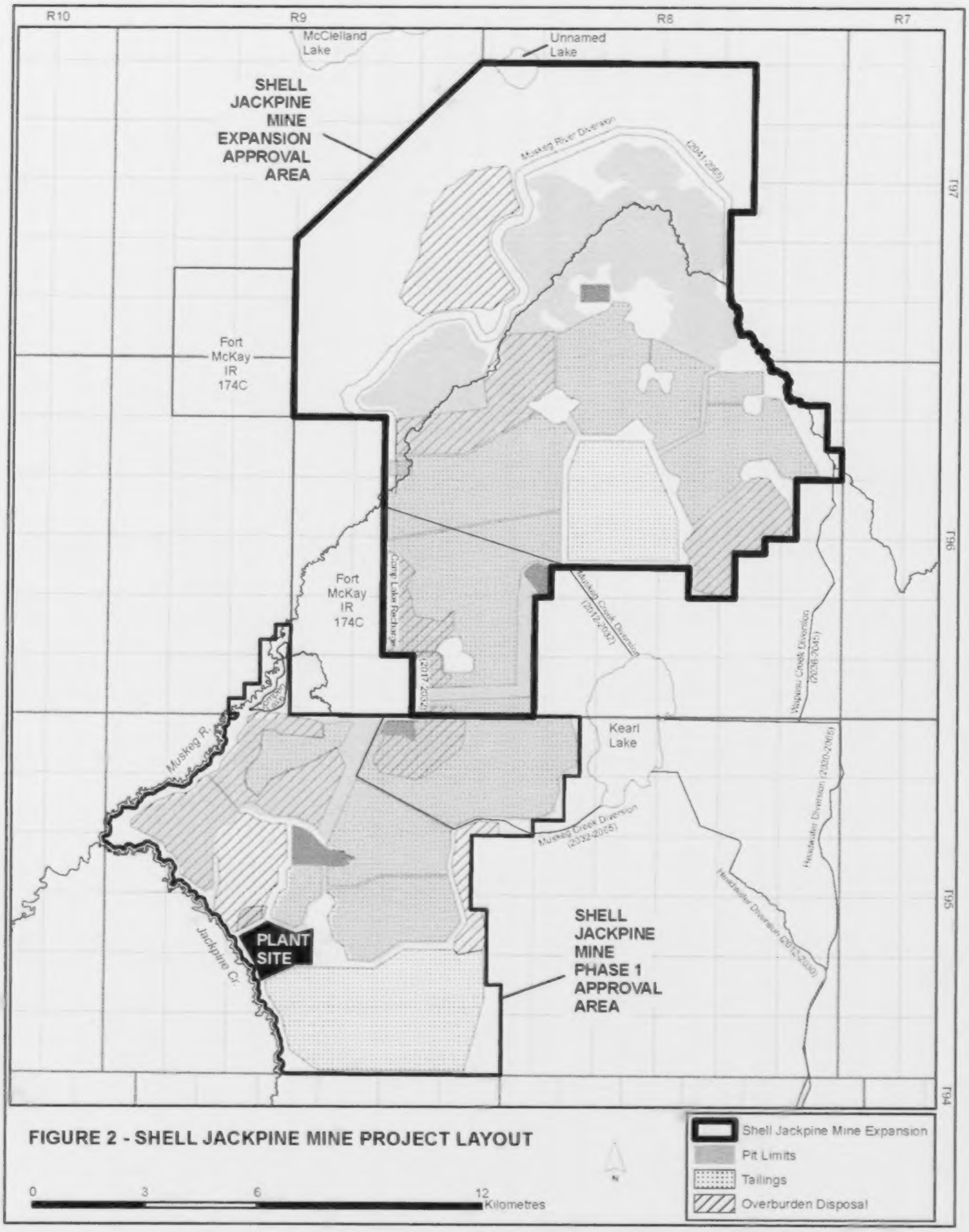
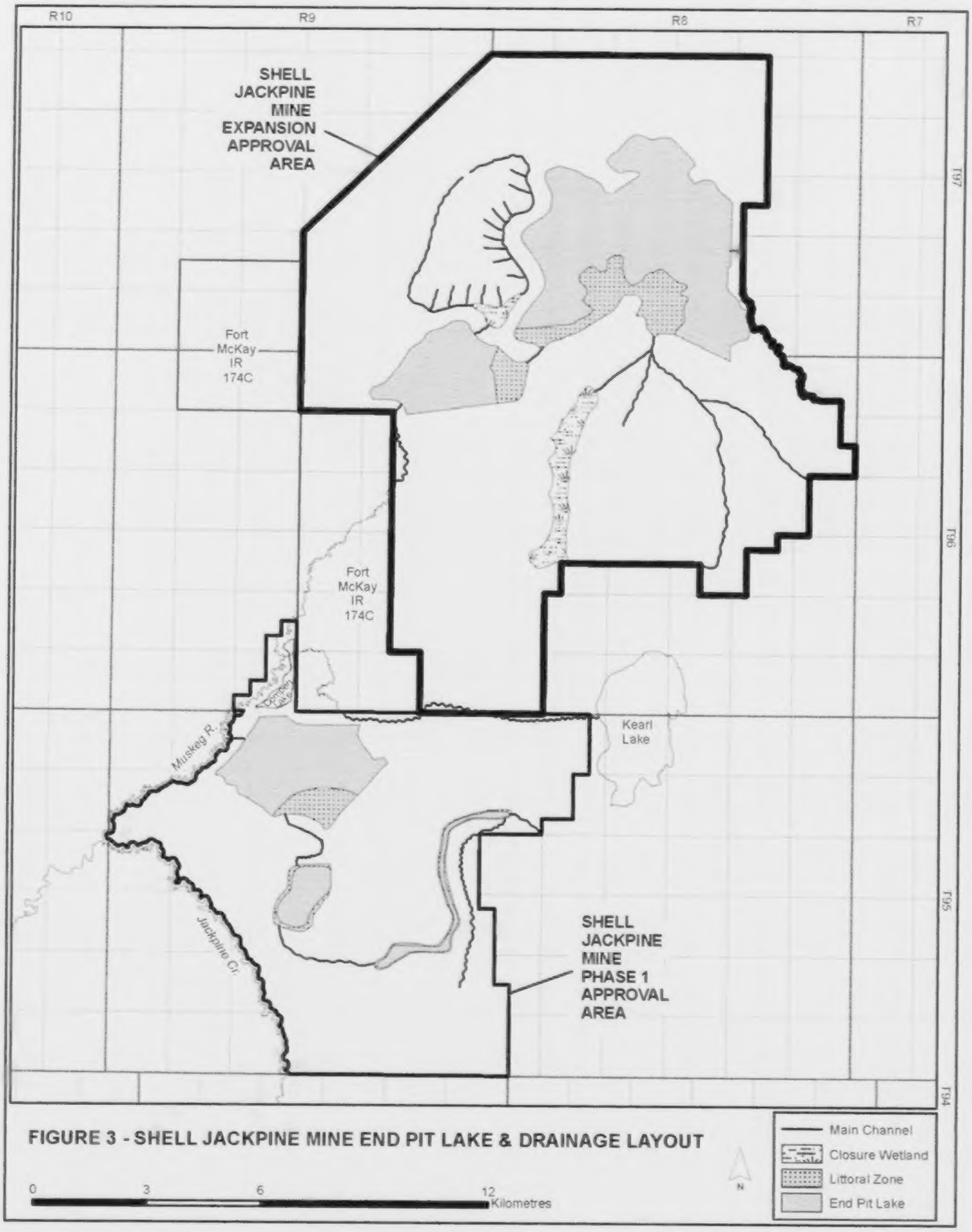


FIGURE 1 - SHELL JACKPINE MINE EXPANSION PROJECT LOCATION

Shell Jackpine Mine Expansion Project Location


R10
R9
R8
R7
McClelland Lake
Unnamed Lake
SHELL JACKPINE MINE EXPANSION APPROVAL AREA
Muskeg River Diversion (2041-2065)
T97
Fort McKay IR 174C
Fort McKay IR 174C
Camp Lake Recharge (2017-2032)
Muskeg Creek Diversion (2012-2032)
Wapasu Creek Diversion (2036-2045)
T96
Kearl Lake
Muskeg R.
Muskeg Creek Diversion (2032-2065)
Headwater Diversion (2030-2065)
Headwater Diversion (2012-2030)
T95
PLANT SITE
Jackpine Cr.
SHELL JACKPINE MINE PHASE 1 APPROVAL AREA
T94
FIGURE 2 - SHELL JACKPINE MINE PROJECT LAYOUT
0
3
6
12
Kilometres
N
Shell Jackpine Mine Expansion
Pit Limits
Tailings
Overburden Disposal

Shell Jackpine Mine Expansion Project Layout



Shell Jackpine Mine Expansion End Pit Lake and Drainage Layout

APPENDIX 10 WILDLIFE TABLES

A. WILDLIFE KEY INDICATOR SPECIES AND RATIONALE USED BY SHELL IN PROJECT EIS (*DERIVED FROM VOL. 5 OF SHELL'S EIA*)

Species	KIR Selection Rationale
moose	CEMA SEWG environmental indicator, economic importance recreational importance, ecological importance, ease of monitoring, traditional importance, abundant information
Canada lynx	Ecological importance (carnivore, predator/prey relationships), traditional and economic importance
black bear	Traditional importance, ecological importance (carnivore), CEMA SEWG environmental indicator
fisher	Ecological importance (carnivore), traditional and economic importance, CEMA SEWG environmental indicator
beaver	Traditional and economic importance (keystone species)
barred owl	Ecological importance (carnivore), member of the CEMA SEWG environmental indicator bird community, indicator old-growth forest birds
black throated green warbler	Member of the CEMA SEWG environmental indicator bird community, indicator old-growth forest birds
yellow rail	Representative of the marsh bird community, riparian health indicator
Canadian toad	Riparian health indicator
horned grebe	Waterfowl indicator

B. LIST OF SPECIES AT RISK FOUND ON OR NEAR THE JPME FOOTPRINT AS PROVIDED BY SHELL AND EC

Species	COSEWIC	SARA	Provincial	Recovery Strategy/ Management Plan in place?	Critical Habitat Identified?
Species observed on JPME lease					
Woodland caribou	Threatened	Threatened	At Risk	Yes	Yes
Wood bison	Threatened	Threatened	At risk	No	
Western toad	Special Concern	Special Concern	Sensitive	No	
Wolverine	Special Concern		May be at risk	No	
Canada warbler	Threatened	Threatened	Sensitive	No	
Olive-sided flycatcher	Threatened	Threatened	May be at risk	No	
Rusty blackbird	Special Concern	Special Concern	Sensitive	No	
Yellow rail	Special Concern	Special Concern	Undetermined	Yes	
Common nighthawk	Threatened	Threatened	Sensitive	No	
Horned grebe	Special Concern		Sensitive	No	
Canada lynx			Sensitive		
Fisher			Sensitive		
Barred owl			Sensitive		
Black-throated green warbler			Sensitive		
Canadian Toad			May be at risk		
Species that occur in the oil sands region and may also occur on Shell's lands					
Short-eared owl	Special Concern	Special Concern	May be at risk	No	
Whooping crane	Endangered	Endangered	At risk	Yes	
Peregrine falcon	Special Concern	Special Concern	At risk	No	
Northern leopard frog	Special Concern	Special Concern	At risk	Yes	
Red knot	Endangered	Endangered	May be at risk	No	